# DOCUMENT RESUME

| | |
|---|---|
| ED 221 682 | CE 033 709 |
| AUTHOR | Wentling, Tim L., Ed. |
| TITLE | ARRIVE. Annual Review of Research in Vocational Education. Volume One. |
| INSTITUTION | Illinois State Board of Education, Springfield. Dept. of Adult, Vocational and Technical Education.; Illinois Univ., Urbana. Dept. of Vocational and Technical Education. |
| PUB DATE | Jun 80 |
| NOTE | 360p. |
| EDRS PRICE | MF01/PC15 Plus Postage. |
| DESCRIPTORS | Affirmative Action; Career Change; Career Development; Correctional Education; Curriculum Development; Disabilities; Disadvantaged; *Educational Research; *Educational Trends; Employed Women; Employment; English (Second Language); Futures (of Society); Instructional Development; Job Training; Limited English Speaking; Minority Groups; Postsecondary Education; *Research Needs; *Research Projects; *Research Reports; Research Utilization; Secondary Education; Sex Fairness; Sex Stereotypes; *Vocational Education; Youth Employment |

ABSTRACT

This book represents a sampling of current research priorities in vocational education along with suggested directions for further education. In the first of the book's five sections, research efforts related to sex equity in vocational education are summarized by M. Eloise Murray. Both sex equity studies and sex affirmation studies are included in this review. Section 2 describes past trends and predicts future trends in vocational education curriculum and instructional research. Reviewer Curtis Finch summarizes research of the 1960s and early 1970s as overly simplistic, while recent research has been more comprehensive and specific. In section 3, research for special needs populations is reviewed by L. Allen Phelps. Four major special populations are addressed: limited English-speaking, handicapped, incarcerated, and disadvantaged learners. Included in this section are four lighthouse studies. Richard W. Feller and David V. Tiedeman examine research related to career development theory in section 4. They first outline the sturcture of career development theory as it has evolved over the past 30 years and then summarize examples of current research in career development theory. In section 5. Robert McGough and Daniel Vogler provide a review of recent research sponsored by the Department of Labor in the area of employment and training. (KC)

***********************************************************************
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
***********************************************************************

ED221682

# ARRIVE

# ANNUAL REVIEW of RESEARCH in VOCATIONAL EDUCATION

## VOLUME ONE

**TIM L. WENTLING,** Editor
UNIVERSITY OF ILLINOIS

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official NIE position or policy

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

C Reisinger

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

**Cooperatively published by**

University of Illinois
College of Education
Department of Vocational and Technical Education
Office of Vocational Education Research

Illinois State Board of Education
Donald F. Muirheid, Chairman
Joseph M. Cronin, Superintendent
Department of Adult, Vocational and Technical Education
Research and Development Section

CE033709

The Office of Vocational Education Research (OVER) was established within the Department of Vocational and Technical Education, College of Education, University of Illinois at Urbana-Champaign in 1978 in an effort to meet the need for expanded research, evaluation and development in vocational education. Tim L. Wentling is Director and all department faculty members are affiliated with the Office of Vocational Education Research. In addition, many graduate students serve as graduate research assistants in one of its programs of research.

The mission of the Office of Vocational Education Research is to advance the involvement of departmental, college, and university faculty in research in vocational education by providing a structure and environment in which major funded research activities can be managed. Further, OVER seeks to provide those agencies, institutions and organizations interested in improving vocational education through research, planning and evaluation with the professional services of a qualified team of individuals. OVER also serves as a forum for the training and upgrading of researchers and provides service and policy consultation to Research and Development funding agencies. In addition, OVER sponsors seminars, workshops and conferences to expand impact on other researchers and professional communities and assists in the sharing and publication of research outcomes.

© 1980 by the University of Illinois Board of Trustees and
the Illinois State Board of Education

## General Review Board:
VOLUME ONE

**RICHARD HOFSTRAND**
*Contract Administrator*
Research and Development Section
Illinois State Board of Education

**MILDRED BARNES GRIGGS**
*Associate Professor and Chairperson*
Home Economics Education
Department of Vocational and Technical Education
University of Illinois at Urbana-Champaign

**H. C. KAZANAS**
*Professor and Chairman*
Department of Vocational and Technical Education
University of Illinois at Urbana-Champaign

**JAMES LEACH**
*Assistant Professor*
Department of Vocational and Technical Education
University of Illinois at Urbana-Champaign

**RONALD McCAGE**
*Manager*
Research and Development Section
Illinois State Board of Education

**J. MARLOWE SLATER**
*Professor*
Department of Vocational and Technical Education
University of Illinois at Urbana-Champaign

## Section Editors:
VOLUME ONE

**M. ELOISE MURRAY**
*Associate Professor*
Division of Occupational and Vocational Studies
*Senior Research Associate*
The Institute for Policy Research and Evaluation
The Pennsylvania State University

**CURTIS R. FINCH**
*Professor and Chairman*
General Vocational and Technical Education
Virginia Polytechnic Institute and State University

**L. ALLEN PHELPS**
*Assistant Professor*
Department of Vocational and Technical Education
University of Illinois at Urbana-Champaign

**RICHARD W. FELLER**
*Assistant Professor*
Counselor Education
Northern Illinois University

**DAVID V. TIEDEMAN**
*Professor and University Coordinator*
Office for Vocational, Technical and Career Education
Northern Illinois University

**ROBERT L. McGOUGH**
*Assistant Professor*
Division of Vocational and Technical Education
Virginia Polytechnic Institute and State University

**DANIEL E. VOGLER**
*Associate Professor*
Division of Vocational and Technical Education
Virginia Polytechnic Institute and State University

# Preface

Researchers in vocational education have recently expressed a concern for the need to improve the focus, conduct, and impact of research activities related to the delivery of vocational education.

In order to affect this area of concern, more about the "state of the art" of research within the realm of priority activities must be known. Examples of quality research need to be identified and "held up" to the community of researchers and potential researchers. This, it is thought, will provide a base for the further judgment of research and for the identification of voids in current research as well as the design of future research. These are the broad goals of this first volume of the *Annual Review of Research in Vocational Education*.

To accomplish these goals, a plan requiring four steps with the involvement of many people was implemented. These steps were: 1) the identification and selection of topic or priority areas, 2) the identification, selection, and invitation of section editors, 3) the review of research and selection of lighthouse studies by section editors, and 4) the compilation and publication of the volume.

Through an analysis of legislation and current research activity, five areas were identified as priorities for program improvement: Sex-Role Stereotyping and Sex Equity, Curriculum and Instruction, Special Populations, Career Development, and Employment and Training. Section editors were then identified and invited based on their expertise in one of these five areas, as exemplified by research experience in the content area, experience in editorial work and recognition as a national leader in research on vocational education. The responsibilities of the section editors included reviewing extant literature on the topic; identifying lighthouse studies which are current (1975-present), exemplary, and which vary on focus, purpose, method and findings; synthesizing the example studies on method, topic and findings, and offering suggestions for future needed research.

The five sections included in this first volume of the *Annual Review of Research in Vocational Education* not only represent a sampling of current research priorities in our field but also provide us with direction for future research. The sections are briefly described in the following paragraphs.

Research efforts related to sex equity in vocational education are summarized by M. Eloise Murray in Section One. A distinction is first made between those studies specifically related to the goal of sex equity and those (termed "Sex Affirmative") which focus on maximizing opportunities for certain groups of people (usually female). Studies of this latter type have been included with sex equity studies, since Murray feels that their results and/or procedures may be used in efforts related to the goal of sex equity. The Kutner and Brogan conceptual model discussed in Nancy Kutner's "Sources of Sex Discrimination in Educational Systems: Implications for Vocational Education" is used as the framework for the classification of research studies in this section. Throughout the exemplary studies, faculty and students (as well as educational materials) are cited by researchers as sources of sexual inequity in vocational education. Kerry Moyer's study, "The Student as a Source of Sex Inequity in Vocational Education" addresses the topic of student attributes which directly influence career choice and notes the effect of parents upon that choice. Jennette Dittman cites the influence of educators' sex-role perceptions (including counselors, teachers, and administrators) upon the career decisions of students. In their study, "Reverse Sex-Stereotyping Case in Point: Court Reporting," Marcia Anderson and Beverly Stitt examine the causes of the exclusion of men from a formerly male-dominated profession. Murray concludes that the "findings from the effort to-date plus the findings of related studies suggest further research is warranted."

Section Two describes past trends and predicts future trends in vocational education curriculum and instructional research. Curtis Finch summarizes research of the 1960's and early 1970's as being "overly simplistic and problematic in nature," while recent research has tended to be more specific and comprehensive. Included in his review are exemplary studies which focus on specific needs in the areas of curriculum and instruction. Sharon Lund O'Neil and Robert Nelson identify those "occupational survival skills" which are essential to job maintenance. "Influence of Reading Ability and Verbal Modality on Principle Learning of Vocational Students" by Bob Stewart, Neil Lash, and H. C. Kazanas emphasizes a need to meet the learning needs of individual students. Dorothy Kizer and M. Marguerite Scruggs examine the tie between student achievement and the behavior of teachers. "Personal Characteristics as a Means for Identifying Adoption-Proneness Among Vocational Teachers" by David Oscarson focuses on how innovations in education are adopted or rejected. Finch suggests that "our future will be greatly influenced by the extent to which systematic, programmatic research activities are carried out."

In Section Three, research "operationally defined to encompass a number of activities that have as a common goal the improvement of vocational programs for special needs populations" is reviewed by L. Allen Phelps. Four major special populations are addressed in his review of research: limited English speaking, handicapped, incarcerated and disadvantaged learners. While there have been many recent legislative mandates for vocational and career education programming for special need groups, Phelps comments that the rate of development and expansion of programs has been restricted due to "fragmented and limited research, development, and dissemination efforts."

Four lighthouse studies are presented. The Olympus Research Corporation conducted two studies by John Walsh in 1974 and by John Walsh and Jan Totten in 1976 which focus on the "policies, programs, and services at the state, local and project level" for the handicapped and disadvantaged. The Iowa Vocational Education/Special Needs Assessment Study by Charles Greenwood and Raymond Morley examines the extent of services provided to disadvantaged and handicapped students by means of 1,265 mail survey responses from state and secondary level vocational education instructors. The Schneck, Lerwick, and Copa study of vocational-technical education programs in Minnesota was commissioned to determine future program needs for services to handicapped or disadvantaged students.

Phelps concludes that these and other studies "suggest a large array of continuing issues and problems requiring research."

Richard W. Feller and David V. Tiedeman examine research related to career development theory with regard to its substantive and procedural dimensions in Section Four. They first outline the "deep structure" of career development theory as it has developed during the past 30 years. The co-editors then summarize examples of current research which exhibit a "continuing search for a comprehensive and more general model" in career development theory as well as an expanding interest in areas such as: career development of women, special needs groups, minorities and youth, effects of sex bias and stereotyping, career indecision and mid-career change. Feller and Tiedeman make a distinction between "decision" and "choice" as a "foundational paradigm for theory in career development" with the intention that the basis for theory be grounded in "personal comprehension of career as a construction perfected through life" rather than in occupational choice.

The National Assessment of Educational Progress (NAEP) was used to survey the educational achievements of four "milestone" age groups (nine, thirteen, seventeen and adult). This assessment is described in "Overview" by Tiedeman, Katz, Miller-Tiedeman and Osipow. The relative effectiveness of the Flanagan, Holland and Roe occupational classification systems is studied in the McLaughlin and Tiedeman study "Eleven-Year Career Stability and Change as Reflected in Project TALENT Data Through the Flanagan, Holland, and Roe Occupational Classification Systems." John D. Krumboltz with Anita M. Mitchell and G. Brian Jones examines the choice of career through a social learning theory analysis. The causal relationships among "career progress, sex-role attitudes, and cognitive styles" is examined by Kass, Moreland, Harren and Tinsley in "Causal Inference Among Variables Related to Career Decision Making: The Chicken or the Egg" Feller and Tiedeman believe the recent challenges of career development theory will help to re-establish the basic "deep structure" of career development theory.

In Section Five, Robert McGough and Daniel Vogler provide a review of recent research sponsored by the Department of Labor in the area of employment and training. The co-editors believe that vocational education researchers have compatible priorities with the Department of Labor, and may therefore have research funds made available to them. They have selected five articles which are representative of "functional areas of policy, forecast, evaluation, demonstration, follow-up and experimental" activities in employment and training (E & T) research.

"A Description of the National Longitudinal Surveys" is provided by Herbert S. Parnes and Kezia Sproat. These studies, which focus upon certain characteristics of the same group of people over two or more points in time, were contracted to examine the labor market experience of men (age 45-59), women (age 30-44), young men and women (age 14-24), and youth (14-21) in the United States. Arnold Katz describes the aims and objectives of the Federal-State Employment Service (ES). The study, "Documentation and Evaluation of CETA-Education Linkage Efforts and Activities in the Commonwealth of Virginia" by Max S. Wortman, Jr., Suzanne Karsa Murrman and Nathaniel Jones examines examples of coordinative efforts of prime sponsors and educators. Russell Rumberger examines the economic position of college graduates between 1969 and 1975 in his article, "The Economic Decline of College Graduates — Fact or Fallacy?" Finally, Bruce McKinlay and Michael R. McKeever describe the Career Information System (CIS), a computerized occupational and educational information delivery system.

McGough and Vogler conclude: "The unique opportunities offered by E & T research involvement will serve to complement the research activities of vocational education with the result being the enhancement of vocational education programs."

In addition to meeting its intended goals, it is hoped that the *ARRIVE* will be used in imaginative ways. The following represent suggested uses or potential outcomes:

1. Review of the section titles should provide the novice with an indication of five perceived priorities for Research and Development in Vocational Education,
2. The "Research Review" segments of each section provide an outstanding base for developing a general understanding of the scope and type of research within a priority area,
3. The lighthouse studies can provide the researcher and potential researcher with ideas regarding topic selection, design and reporting,
4. The presentation of selected studies can serve to reinforce exceptional work and say "well done," and
5. The total volume can provide input to the identification of needed research for use by individual researchers as well as by personnel in agencies responsible for funding research and development activities.

This volume represents the efforts of many individuals playing many different roles. The General Review Board members, the section editors and the contributing authors are all due an extension of gratitude. Additionally, the utmost thanks are due to Deborah K. Nelson for her expert assistance in handling the technical editing and administrative details of this volume.

June 1980

Tim L. Wentling, Editor

# Contents

**SECTION ONE:**
Research on Sex Equity in Vocational Education
M. ELOISE MURRAY, Section Editor

RESEARCH REVIEW ........ 3

Sources of Sex Discrimination in Educational Systems: Implications for Vocational Education
NANCY G. KUTNER ........ 11

The Student as a Source of Sex Inequity in Vocational Education
KERRY MOYER ........ 21

Sex-Role Perceptions of Vocational Educators: A Variable in Achieving Sex Equity
JENNETTE DITTMAN ........ 33

Reverse Sex Stereotyping
Case in Point: Court Reporting
MARCIA A. ANDERSON and BEVERLY A. STITT ........ 43

SYNTHESIS ........ 53

**SECTION TWO:**
Research on Vocational Education Curriculum and Instruction
CURTIS R. FINCH, Section Editor

RESEARCH REVIEW ........ 59

Career Maintenance and Mobility Factors — Occupational Survival Skills
SHARON LUND O'NEIL and ROBERT E. NELSON ........ 69

Influence of Reading Ability and Verbal Modality on Principle Learning of Vocational Students
BOB R. STEWART, NEIL A. LASH and H. C. KAZANAS ........ 85

Cognitive Interaction and Learning
DOROTHY KIZER and M. MARGUERITE SCRUGGS ........ 91

Personal Characteristics as a Means for Identifying Adoption-Proneness Among Vocational Teachers
DAVID J. OSCARSON ........ 99

SYNTHESIS ........ 109

**(Contents continued on next page)**

## SECTION THREE:

Research on Vocational Education Programs for Special Populations
L. ALLEN PHELPS, Section Editor

RESEARCH REVIEW .......... 115

An Assessment of Vocational Education Programs for the Disadvantaged under the 1968 Amendments to the Vocational Education Act: A Summary
JOHN WALSH and JAN L. TOTTEN .......... 125

An Assessment of Vocational Education Programs for the Handicapped under the 1968 Amendments to the Vocational Education Act: A Summary
JOHN WALSH .......... 137

Iowa Vocational Education/Special Needs Assessment Survey
CHARLES S. GREENWOOD and RAYMOND E. MORLEY .......... 163

Assessment of the Prevalence and Service Need Requirements of Handicapped and Disadvantaged Students in Vocational-Technical Education Programs in Minnesota
GERALD R. SCHNECK, LOWELL P. LERWICK and GEORGE H. COPA .......... 177

SYNTHESIS .......... 185

## SECTION FOUR:

Research Grounds of Career Development Theory, 1975 —
RICHARD W. FELLER and DAVID V. TIEDEMAN, Section Editors

RESEARCH REVIEW .......... 201

Overview (from *The Cross-Sectional Study of Early Career Development as Revealed by the National Assessment of Education Progress*)
DAVID V. TIEDEMAN, MARTIN R. KATZ, ANNA MILLER-TIEDEMAN and SAMUEL H. OSIPOW .......... 223

Eleven-Year Career Stability and Change as Reflected in Project TALENT Data Through the Flanagan, Holland, and Roe Occupational Classification Systems
DONALD H. McLAUGHLIN and DAVID V. TIEDEMAN .......... 243

A Social Learning Theory of Career Selection
JOHN D. KRUMBOLTZ with ANITA M. MITCHELL and
G. BRIAN JONES .......................................259

Causal Inference Among Variables Related to Career
Decision Making: The Chicken or the Egg
RICHARD A. KASS, JOHN R. MORELAND, VINCENT A. HARREN,
and HOWARD E. A. TINSLEY ............................283

SYNTHESIS ..........................................295

**SECTION FIVE:**
Research on Employment and Training
ROBERT L. McGOUGH and DANIEL E. VOGLER, Section Editors

RESEARCH REVIEW ....................................317

A Description of the National Longitudinal Surveys
HERBERT S. PARNES and KEZIA SPROAT .................323

Nonexperimental Evaluations of Employment Service
Influence on Search Times and Earnings
ARNOLD KATZ ........................................331

Documentation and Evaluation of CETA-Education
Linkage Efforts and Activities in the
Commonwealth of Virginia
MAX S. WORTMAN, JR., SUZANNE KARSA MURRMAN,
and NATHANIEL JONES .................................337

The Economic Decline of College Graduates:
Fact or Fallacy?
RUSSELL W. RUMBERGER ..............................343

The Career Information System:
A Decade of Developmental Research
BRUCE McKINLAY and MICHAEL R. McKEEVER ..............353

SYNTHESIS ..........................................363

# SECTION ONE

## Research on Sex Equity in Vocational Education

---

M. ELOISE MURRAY
The Pennsylvania State University

# Research Review

## INTRODUCTION

The purpose of this section is to summarize research effort related to sex equity in vocational education. One of the perplexing tasks associated with this responsibility was the decision-making necessary to determine which studies were specifically focused on the goal of sex equity and which were efforts directed toward maximizing opportunities for a specific group, usually females. The latter behavior has been identified as *sex affirmativeness* by the Resource Center on Sex Roles in Education (1977). While consideration of developing nontraditional vocational options for women may have been a beginning focus and remains a necessary and critical concern, it is not a sufficient definition of the challenge to develop sex fair vocational education programs. Several of the studies included in this review are sex affirmative in nature; however, their procedures and/or findings offer examples for persons concerned with sex equity.

Three additional comments about this review bear mentioning. First, the concern for sex equity in education was not initiated in vocational education. Indeed there appears to be evidence in some sectors that vocational educators are reluctant entrants to this arena. Those vocational educators who are interested in sex equity as an area of research are advised to examine practices and progress of those working in other educational settings. Second, the literature examining sex equity in vocational education is largely fugitive. The system of funding of projects has resulted in reports that often do not receive large dissemination. In addition to standard library procedures, each state sex equity coordinator and research unit coordinator was contacted to obtain relevant reports; however, a less than 35 percent return rate probably indicates there are other studies awaiting discovery. Third, the nature of the project system in vocational education with the concomitant requirement of usefulness to the field means that much of the research is of an applied nature. This observation is made as a statement of fact, not as an evaluative comment.

## OVERVIEW OF RESEARCH IN SEX EQUITY

The framework used in this review for classifying the research studies in the area of sex equity is the Kutner and Brogan conceptual model (1976), a discussion of which is the lead article in this section. This model views sex equity or inequity as an intervening variable in the relationship of a large number of independent variables and the resulting dependent variable of achievement in education and consequently in occupation. The researchers cited may not have construed their studies in this manner and indeed some studies lie outside the variables identified by the model; however, it provides a system of analysis which is heuristic.

### Internal Structures of Individuals

Two groups of subjects, faculty and students, have been the principal targets of those researchers examining the sex equity issue through the anaylsis of the psychological-cognitive structure (see Figure 2 of Kutner article). These variables include occupational aspiration and expectation, self concept, sex role orientation and the effect of the socialization process.

Using data from a state-wide assessment program, Moyer synthesized two previous reports by Moyer (1978) and Moyer and Skiffington (1978) as the second featured study in this section. These data suggest students themselves are a source of inequity in vocational program enrollments. This conclusion is supported by Gulledge (1978), McEwen, Brock, Moseley, Muncey, Rich, Davis, and Porter (1978) and Ott (1978) from somewhat more limited studies. McEwen et al. noted:

> Culturally supported sex stereotypes of occupations are quickly learned by young people and act to channel and limit their aspirations for jobs and careers. These are often reinforced — and occasionally challenged — by the expectations of educators, peers and parents and by the role models evident in the mass media and in the life experience of young people. (1978, p. 1)

Mitchell (1977) concluded after her study of attitudes toward vocational education that adolescent females are still likely to choose a traditionally female identified program even while they believe they could enter a previously male intensive program. However, there is evidence that school personnel do seek to influence choices. With particular regard to the handicapped student, Danker-Brown, Sigelman and Flexer (1978) found that while males and females did not differ in the amount of vocational training, "qualitative differences in training were consistent with sex role stereotypes, and females were more likely to have been exposed to sheltered forms of employment." (p. 45)

Lewis, Kaltreider, Murray, Lewis, and Flanary (1976), Mitchell (1977) and Ott (1978) included in their studies the impact of others such as parents and school faculties upon the adolescent's choice of program. In general, the research examining these interactive relationships suggests efforts to develop sex equity in vocational education need to be directed toward all sectors of the school structure including parents and the work place. The work of Bucher (1974) and Guiry (1978) suggests that change of efforts with students should begin early in their school years and be reinforced as they proceed toward vocational choice.

The factors affecting adolescent students do not necessarily apply to the postsecondary vocational education participant. Chitayat and Hymer (1976) document a process used to recruit mature female students. Kane, Frazee, and Dee (1976) explored in detail those factors affecting the mature female student's selection of a non-traditional vocational education program.

Perhaps even more than general education, vocational education extends beyond the school into the community because of the need to place students in work roles, either on a part-time or cooperative education basis or as full participants in the labor force. The findings of Barenbaum (1977) suggest employers practice sex discrimination and sex stereotyping in hiring personnel. even when they are able to identify the most qualified job applicant.

The third example study in this section based on Dittman (1976) is representative of those which select faculty as the population for examining the sex equity issue. Unlike the early and important work of Steele (1974) and the report of the Sex Equity Unit of South Carolina (1978), these studies do not seek to only indicate sex ratios in faculty and student populations but also to document the faculty members' perceptions of appropriate sex role orientation on the assumption that such perceptions influence behavior toward students. Dittman (1976), Eversole (1977) and Hantjis (1977) indicate that vocational educators hold sex stereotyped views. This finding is not monolithic, for educators in various program areas differ in the degree to which they hold such views. In summary, females have less stereotypic views than males; home economics, health occupations and office occupations personnel are more liberal and more knowledgeable than agricultural and trade and industries personnel; those persons who have less stereotypic views have greater intent of changing their behavior. Using Idaho vocational educators, administrators and counselors as the populations, Kaufman, Oaks and Rauch (1978) concluded that vocational educators feel more dissatisfaction with student sex ratios per program than with teacher proportions. However, while enrollment disparities were considered by vocational educators to be neither satisfactory nor ideal they were perceived to be practical and satisfactory to the community. The work of Dennison (1978) using a population of vocational administrators supports these general conclusions.

The complex nature of the relationship between vocational education personnel and sex equity in vocational programs is well documented by Atkinson (1978) in the following summary:

> Among a majority of respondents, the sources of sex-role stereotyping are perceived to exist outside as well as within the educational system.
>
> However, four factors suggest that for a majority of the respondents sampled, sex-role stereotyping and bias in the schools is not perceived to be a major cause of limited vocational opportunity at the secondary level. First, only a few respondents linked sex-role stereotyping with limited vocational opportunity. Second, most respondents did not identify barriers in the school system with expanding vocational options. Third, sex-role stereotyping is perceived by many educators to impact insignificantly to people's lives. Fourth, the lack of high priority status which respondents assigned to eliminating sex-role stereotyping is consistent with their limited perceptions of the issue of sex-role stereotyping in vocational education.
>
> Perhaps these points of view may be attributed to the phenomenon of a few students entering vocational programs in which they have not traditionally participated. (p. 11)
>
> And further, among educators, articulation of the issue of sex-role stereotyping and its manifestations in vocational education depends upon an understanding of how socialization through sex and gender effects occupational choice and preparation. Only through awareness of the issue of sex-role stereotyping in vocational education will educators be equipped to recognize common problems. A needs assessment among secondary schools (in Michi-

> gan)* should not be undertaken without the skills to identify how, when, and where sex-role stereotyping can be manifested in a vocational education setting. (p. 12)

Relative to needs assessment, Sorg (1978) has developed and field tested a model, for use by vocational educators, which will assess the extent to which sex bias and sex stereotyping exist in programs. Further development including refining of measures is currently in progress (Sorg, 1979).

The role of counselors and their views related to the issue of sex equity with regard to vocational student's choice of program was not included as a separate entity in this review. Many of the studies cited did investigate these variables. In addition, there is a large and growing body of literature originating from personnel and guidance investigators attempting to identify and overcome what has been a generally negative situation. Vocational educators would be advised to review this literature for both findings and procedures.

Neely, Wilson, Schuley, and Kegg (1978) provide extensive documentation on the sex bias barriers perceived to exist for women aspiring to vocational administration posts. This interim report will benefit from further elaboration and explanation of the findings.

### Formal Structures of Educational Systems

One aspect of the formal structure of school systems identified by Kutner and Brogan (1976) as a potential source of sex bias and stereotyping is educational materials. Bannon (1975), Ray and Dohner (1978) and Weis (1979) all conclude that in the area of home economics, materials exhibit less than equitable treatment of males and females. Weis (1979) summarizes as follows:

> Although home economics textbooks generally imply an orientation to a gender neutral student clientele or explicitly orient their prefaces to both sexes, the contents of these educational materials presented sex bias in language usage, pictures portraying male and female role requirements, and in role behaviors and expectations emphasized. (p. 158)

Similar findings are reported by Lovell (1977) in the area of career education. No related studies examining materials in other areas of vocational education were located.

The role that recruitment materials and procedures may play in the sex ratio of student enrollment was examined by Anderson and Stitt (1978). A summary of this research appears as the fourth example study in this section.

### Efforts Directed toward Change

The projects which attempted to change the attitudes and behaviors of personnel in vocational education, including students, teachers, counselors and administrators, were the largest single category related to the issue of sex equity; yet, in fact, most are best described as sex affirmative effort. As projects they vary immensely in their completeness. Some develop materials and/or approaches and provide no data on use, Ellis (1977), Murray (1978); some provide purely descriptive data. Lerner, Bergstrom, Champagne (1976), Smith (1977), Caughman (1978), Ferris (1977, 1978). In spite of design deficiencies, each of these efforts does make a contribution to future studies.

---

* Reviewer's parentheses.

Those studies which provide pre/post data are somewhat inconclusive in supporting the hypothesis that short term effort can change vocational educators' attitudes and perceptions with regard to sex equity. That the literature related to attitude change in general and to factors associated with compliance with regulations indicate such inconclusiveness is not surprising. Working with home economics teachers (female) and vocational counselors (male) with a five hour workshop as treatment, Griffin (1978) obained statistically significant differences (p = .001) on an instrument developed for the study called Sexism Awareness Instrument. The teachers consistently scored higher than counselors on this instrument (p = .001) for both pre- and post-test scores. This finding is very much in keeping with those studies cited above which noted that females are generally more aware of sexism and more open to change. Walters (1976) used a similar approach to determine if vocational education personnel would change their attitudes toward women's role in education and the labor force. The findings were that while administrators changed on pre- and post-test scores on the Rokeach Dogmatism Scale (p = .025), they did not change significantly on a measure titled Attitudes Toward Women Scale.

Working with mature females who are potential vocational education program participants and using a three week workshop as treatment, Willis and Hopson (1979) concluded that the participants' attitudes toward availability of non-traditional jobs (to them) had changed significantly. Further, it was the attitudes of the men in their lives which hindered pursuit of non-traditional employment. This latter finding supports the notion that change in vocational education involves effort with persons beyond the actual school.

## SUMMARY

The available studies concerning the issue of sex equity in vocational education investigate a large number of the independent variables suggested by Kutner and Brogan (1976). The model suggests other areas of study. Many studies go beyond this model and offer promising leads.

Based on the studies reviewed, one can say that sex bias and sex stereotyping exist in the attitudes and behaviors of participants in vocational education. These participants include students at both secondary and post-secondary levels, members of students' families, teachers, administrators and those who hire the products of vocational education programs. The materials used in vocational programs also exhibit a lack of sex equity. Efforts at changing the situation meet with varying degrees of success.

The following pages of this section include the reports of the model and research prepared by Nancy G. Kutner, Kerry Moyer, Jennette Dittman, Marcia A. Anderson and Beverly A. Stitt and a comment or synthesis on their works by the section editor.

18

## REFERENCE NOTE

1. Sorg, S. E. Personal Communication, 1979.

## REVIEW REFERENCES

Anderson, M. A., & Stitt, B. A. *Reverse sex stereotyping case in point: Court reporting.* Carbondale, Ill.: Southern Illinois University, 1978.

Atkinson, K. *Sex-role stereotyping in vocational education: Report on the perceptions of Michigan educators.* Kalamazoo: Western Michigan University, 1978.

Bannon, C. *Sex-stereotyping in high school consumer education textbooks.* Unpublished doctoral dissertation, Northern Illinois University, 1975.

Barenbaum, A. *Sex-based discrimination in hiring practices by employers in the city and county of Philadelphia.* Unpublished doctoral dissertation, Temple University, 1977.

Bucher, C. H. *The impact of a non-stereotyped sex-role occupational unit of elementary school children's occupational knowledge, vocational aspirations and expressed occupational attitudes.* Unpublished doctoral dissertation, University of Virginia, 1974.

Caughman, A. Y. *Female access to careers in engineering technology.* Charleston, S.C.: Trident Technical College, 1978.

Chitayat, D., & Hymer, S. *The new occupational student: The mature adult woman* (Rep. #CASE 35-76). New York: Institute for Research and Development in Occupational Education, 1976.

Danker-Brown, P., Sigelman, C. K., & Flexer, R. W. Sex bias in vocational programming for handicapped students. *Journal of Special Education,* 1978, *12*(4), 451-458.

Dennison, J. A. *Administrators' attitude toward the role of women.* Unpublished doctoral dissertation, University of Missouri-Columbia, 1978.

Dittman, J. *Sex-role perceptions of North Dakota vocational educators.* Bismarck: North Dakota Research Coordinating Unit, State Board for Vocational Education, 1976.

Ellis, M. *Expanding non-traditional opportunities in vocational education.* College Park, Md.: Ellis Associates, Inc., 1977.

Eversole, J. *Relationships between sex role attitudes of Pennsylvania vocational educators and their stated beliefs about their own sex role orientation.* Unpublished Master's thesis, The Pennsylvania State University, 1977.

Ferris, C. J. *Expanding adolescent role expectations: Information, activities, resources for vocational educators.* Ithaca: Cornell University, 1977.

Ferris, C. J. *State-wide vocational in-service for reducing sex stereotyping and bias:* 1977-78 Report. Ithaca: Cornell University, 1978.

Griffin, W. P. *Stamp out sexism: A Texas awareness project* (Project No. 78230176). Austin: The University of Texas, 1978. (a)

Griffin, W. P. *The development and pilot testing of a model to create awareness of sex bias and sex stereotyping in vocational education* (Project Nos. 78230176 and 89230061). Austin: The University of Texas, 1978. (b)

Guiry, R. W. *The effects of a formal career education program on career development and sex-role stereotyping of eighth grade students.* Unpublished doctoral dissertation, St. John's University, 1978.

Gulledge, E. N. *A study of contributory factors to sex stereotyping of females in vocational education in Okaloosa and Walton Counties, Florida.* Unpublished doctoral dissertation, The Florida State University, 1978.

Hantjis, A. P. *The relationship between knowledge and between attitudes and behavioral intent concerning sex-role stereotyping in vocational education.* Unpublished doctoral dissertation, Rutgers University, 1977.

19

Kane, R. D., Frazee, P., & Dee, E. *A study of the factors influencing the participation of women in non-traditional occupations in post-secondary area vocational training schools* (Contract No. 300-75-0183). Arlington, Va.: RJ Associates, Inc., 1976.

Kaufman, J. J., Oaks, M., & Rauch, C. *A report of a study of sex bias perceptions in Idaho vocational programs.* Moscow: University of Idaho, 1978.

Kutner, N. G., & Brogan, D. Sources of sex discrimination in educational systems: A conceptual model. *Psychology of Women Quarterly,* 1976, *1,* 50-69.

Lerner, J., Bergstrom, F., & Champagne, J. E. *Project EVE: Equal vocational education* (Contract Nos. 52350387 and 62350237). Texas: University of Houston, 1976.

Lewis, M. V., Kaltreider, L. W., Murray, M. E., Lewis, L., & Flanary, P. E. *Attempts to overcome sex stereotyping in vocational education* (Project No. V0134V2). University Park, Penn.: Institute for Research on Human Resources, 1976.

Lovell, M. G. *A descriptive study of sex-role stereotyping in selected secondary level non-commercially developed career education instructional materials.* Unpublished doctoral dissertation, George Washington University, 1977.

McEwen, C. A., Brock, C., Moseley, M., Muncey, D., Rich, J., Davis, D., & Porter, M. *Sex role stereotyping and participation in vocational education: Evidence from Maine region ten.* Department of Education, State of Maine, 1978.

Mitchell, M. H. *Attitudes of adolescent girls toward vocational education* (Project No. 13-76-C14). Bloomington: Indiana University, 1977.

Moyer, K. L. *Sex differences in vocational attitudes and knowledge of eleventh grade students in Pennsylvania.* Harrisburg: Division of Research, Pennsylvania Department of Education, 1978.

Moyer, K. L., & Skiffington, E. W. *Sex differences in vocational aspirations and expectations of Pennsyvania eleventh grade students.* Harrisburg: Division of Research, Pennsylvania Department of Education, 1978.

Murray, M. E. *Assisting vocational education personnel to eliminate sex bias from their programs* (Project No. 86-8020). University Park: The Pennsylvania State University, 1978.

Neely, M., Wilson, A., Schuley, M., & Legg, M. *Interim report: To study a program to overcome sex bias barriers in women's qualifications for vocational administration posts* (Project No. 498AH 70068, Grant No. G00-77-01926). Manhatten: Kansas State University, 1978.

Ott, M. D. *The identification of factors associated with sex-role stereotyping in occupational education* (VEA-78-3A-903). Ithaca: Cornell University, Institute for Occupational Education, 1978.

Ray, E. M., & Dohner, R. E. *Project to update textbooks and materials in the home economics curriculum resource center with particular attention to the elimination of sex biased stereotyped materials* (Project No. 86-8023). University Park: The Pennsylvania State University, 1978.

Resource Center on Sex Roles in Education. *Overcoming sex discrimination and attaining sex equity in vocational education: The social/educational and legal contexts.* Washington, D.C.: National Foundation for the Improvement of Education, October 1977.

Smith, A. J. *New pioneers: The North Carolina project to eliminate sex bias in occupational education.* Raleigh: North Carolina Department of Public Instruction, 1977.

Sorg, S. E. *The development of a model to identify needs associated wih sex-role stereotype in vocational education in Florida.* Unpublished doctoral dissertation, The Florida State University, 1978.

South Carolina State Department of Education. *Report on the status of males and females in vocational education.* Columbia: Author, Sex Equity Unit, 1978.

Steele, M. *Women in vocational education: Project baseline supplementary report*. Washington, D.C.: Technical Education Research Centers, Inc., 1974.

Walters, N. *Women and career options: Final report*. Warrensburg: Central Missouri State University, 1976. (Mimeo)

Weis, S. F. Examination of home economics textbooks for sex bias. *Home Economics Research Journal*, 1979, *7*(3), 147-162.

Willis, C., & Hopson, C. S. *Project S.W.I.M.* New Orleans: Delgado College, 1979. (Mimeo)

# Sources of Sex Discrimination in Educational Systems: Implications for Vocational Education

NANCY G. KUTNER
Emory University

In this paper, a framework for a general conceptual model interrelating sources of sex discrimination in educational systems (Kutner & Brogan, 1976) is reviewed. Sex differences in mathematics training and careers are discussed as an illustrative case, and implications of the model for vocational education are outlined.

## ASSUMPTIONS OF THE MODEL

Although both males and females are victims of sex discrimination in educational systems, it is assumed that females are victims to a greater extent than are males. Alexander and Eckland (1974), who examined the effects of sex, status background, and academic ability in an elaborated school process model, found that "the most significant feature . . . was the direct, unmediated depressant sex effect on actual educational attainment." This effect remained "despite simultaneous controls on a large number of variables pertinent to educational attainments: academic ability, status background, performance, educational goal orientations, academic self-concept, curriculum enrollment, and the influence of various significant others (parents, teacher, and peers)." (p. 680)

A second assumption of the general model is that women may be viewed conceptually as a "minority group" (Hacker, 1951). General theoretical perspectives on majority-minority relations such as those discussed by Blalock (1967) can then be applied to discrimination experienced by women in our society.

Following Blalock (1967), "certain independent variables lead to discrimination, which in turn produces inequalities . . ." (p. 18) Thus, the concept of *discrimination* (in this case, sex discrimination in education) can be viewed as a variable *intervening* in a causal sequence which links various independent variables and the dependent variable of *inequality* (in this case, sex inequalities in educational achievement). A model of discrimination and resulting sex inequalities in educational achievement is outlined in Figure 1.

The general model presented in Figure 1 is believed applicable to all levels of the educational system. At the time that formal vocational education is introduced, typically during the early adolescent years, important aspects of young people's psychological-cognitive outlook, which in turn influence their occupational orientations, have already been shaped.

## COMPONENTS OF THE MODEL

### The Dependent Variable: Sex Inequalities in Educational Achievement

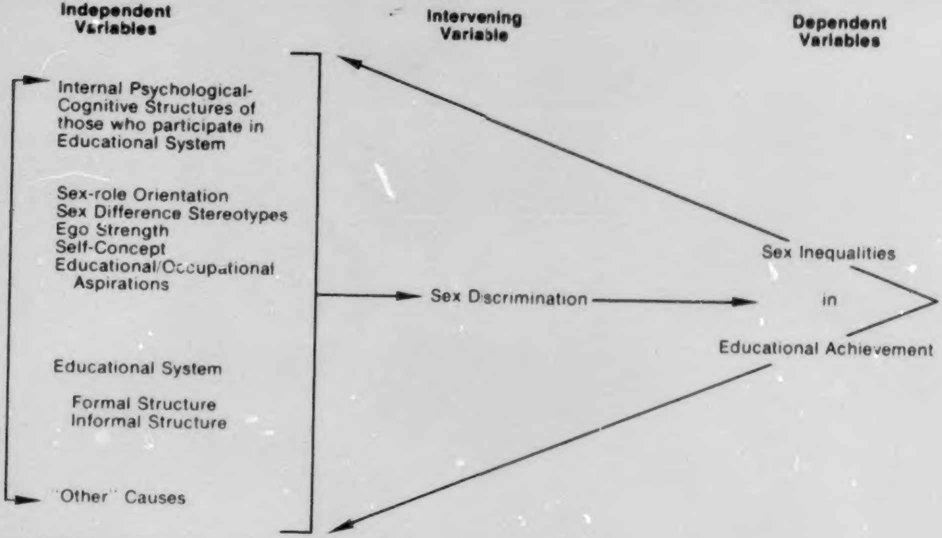
Important manifestations of sex inequalities in educational achievement include sex differences in academic achievement (e.g., lower average scores for females on the quantitative section of college entrance examinations); lower enrollment of women as compared to men in graduate, professional, and post-secondary technical schools; and the lower number of women as compared to men who obtain graduate and professional degrees.

*Academic achievement.* At the elementary school level, there is little

---

NANCY KUTNER is a Medical Sociologist at Emory University School of Medicine, Department of Rehabilitation Medicine, Atlanta, Georgia.

**FIGURE 1**
Conceptual Model of Processes Contributing to Sex Discrimination in American Education (Kutner and Brogan, 1976)


Independent Variables
Intervening Variable
Dependent Variables
Internal Psychological-Cognitive Structures of those who participate in Educational System
Sex-role Orientation
Sex Difference Stereotypes
Ego Strength
Self-Concept
Educational/Occupational Aspirations
Educational System
Formal Structure
Informal Structure
"Other" Causes
Sex Discrimination
Sex Inequalities
in
Educational Achievement

difference between males' and females' measured academic achievement in mathematics and science. Hilton and Berglund (1974) used a longitudinal design to study mathematics achievement and interests over a seven year period with a large sample of students, beginning at the fifth grade level. Although girls and boys were equivalent in mathematics achievement in the fifth grade, significant differences by sex in *interest* in math and science began emerging at grade nine, with differences widening at the eleventh grade level. In addition, males had successively higher mean math achievement scores than did females at subsequent grade levels after grade five.

Females are significantly less likely than males to take four years of high school mathematics (Sells, 1973; Ernest, 1976). This fact has important implications for females' higher education at a school such as Berkeley: "The 4 year math sequence is required for admission to Mathematics 1A, which in turn is required for majoring in every field at the University *except* the traditionally female, and hence lower paying, fields . . ." (Ernest, 1976, p. 9).

At the college level, women tend to get better grades than do men in *all* fields. Ernest (1976) found no significant differences in the grades achieved by women and men in the elementary calculus sequence. However, as noted above, women are less likely than men to *take* mathematics courses in college.

In graduate and professional schools, there is little difference between the measured academic achievement of men and women. For example, women perform as well as, or better than, men in medical school (Lopate, 1968; Weinberg & Rooney, 1973). But it should be noted that these are women who have been carefully selected for medical school and often have higher academic qualifications than men who are admitted (Feldman, 1974; Kutner & Brogan, 1977).

The conclusion which emerges is that women are equally capable of achieving academically at levels characteristic of their male peers. The *nature* of women's achievement tends to differ, however, in that women are less likely than men to pursue the mathematics and science courses which would prepare them for careers in mathematics-related fields such as statistics or operations research, or for careers in medicine, engineering, and other scientific fields.

*Enrollment in graduate, professional, and post-secondary technical schools.* Although the enrollment of males and females in educational institutions is about equal through elementary, secondary, and undergraduate school, fewer women than men are enrolled as graduate students. In addition, in post-secondary technical schools, graduate schools, and professional schools, there are a number of fields which have an underrepresentation of women or men. For example, women are underrepresented in technical school areas such as auto mechanics, carpentry, and bricklaying, while men are underrepresented in areas such as secretarial training. Although more men now enter fields such as nursing and elementary education, and more women now enter fields such as medicine, dentistry, and law than has been true in the past, the former fields are still female-intensive while the latter fields remain male-intensive. And, as Pitts (1973) points out, a much publicized increase in the *numbers* of women admitted to medical school may actually mask the much slower increase in the *percentage* of women in medicine.

*Level of educational attainment.* Although a slightly larger percentage of *females* than males graduate from high school, more *males* than females graduate from college and a much larger percetage of *males* than females obtain graduate and professional degrees. The more advanced the academic degree, the less likely women are to receive it in most cases, as illustrated in Table 1 for the three mathematics-related fields of statistics, computer/information science, and operations research.

### Intervening Variable: Sex Discrimination in the Educational System

"Sex discrimination" is a global variable which encompasses all the differential influences on males and females which stem from independent variables in the model. The total amount of sex discrimination produced or experienced will vary from one individual to another and as a function of the particular educational setting (school and surrounding community).

The two major categories of independent variables included in the model, i.e. the internal psychological-cognitive structures of individuals participating in the educational system and the educational system itself, are linked through the mind-sets which participants, both students and educational personnel, bring with them into the system and which shape their behavior as they participate in the system.

### Independent Variables

Numerous independent variables are thought to contribute to sex discrimination and hence to sex inequalities in educational achievement and opportunities; more detailed diagrams interrelating these variables are contained in Figures 2 and 3.

*Internal psychological-cognitive structures of individuals who participate in the educational system.* The model emphasizes two major structures which predispose individuals (female as well as male) to define females in ways leading to sex discrimination:

*Sex-role orientation:* A normative view of appropriate behavior for males and females. Sex-role orientation can be conceptualized as a continuum of traditional to nontraditional attitudes about appropriate behavior for males and females (Brogan & Kutner, 1976).

*Sex difference stereotypes:* Perceptions of "typical" characteristics (personality traits, interests, etc.) and behavior of males and females. The most damaging sex difference stereotype in our culture is the generalized view that females are less competent than males (Broverman, Vogel, Broverman, Clarkson, and Rosenkrantz, 1972).

Sex-role orientation and sex difference stereotypes are shaped during the individual's socialization by primary group (family, peers) and by secondary group (larger society, e.g., media) agents. During the socialization process, the individual acquires shared cultural definitions of appropriate behavior for his/her gender and

**TABLE 1**
Total Number of Earned Degrees Conferred, 1974-75,
and Percentage of Women Receiving Degrees, in Statistics,
Computer/Information Sciences, and Operations Research

| | Statistics | | Computer/Info. Sciences | | Operations Research | |
|---|---|---|---|---|---|---|
| | Total Degrees | Women | Total Degrees | Women | Total Degrees | Women |
| Bachelor's Degrees requiring 4 or 5 years | 213 | 32% | 5039 | 19% | 279 | 4% |
| Master's Level Degrees | 449 | 24% | 2299 | 15% | 489 | 7% |
| Doctor's Level Degrees | 158 | 10% | 213 | 6% | 73 | 3% |

Source: Baker & Wells (1977).

FIGURE 2
Independent Variables: Internal Psychological-Cognitive Structure of Individuals Who Participate in Educational System

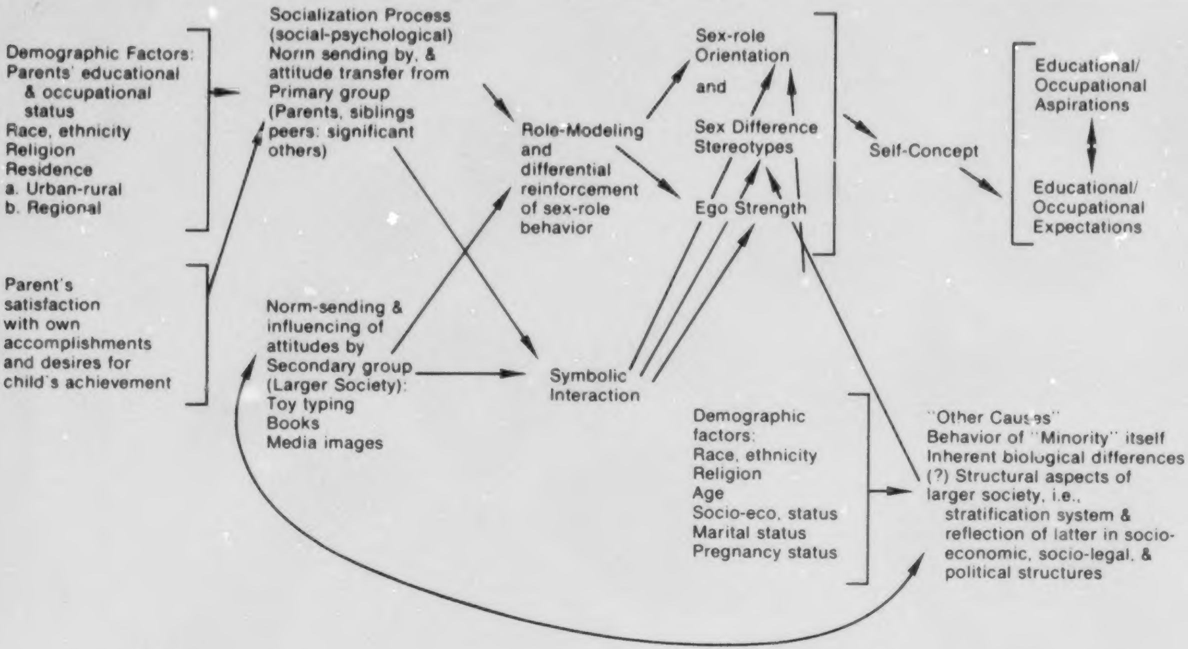
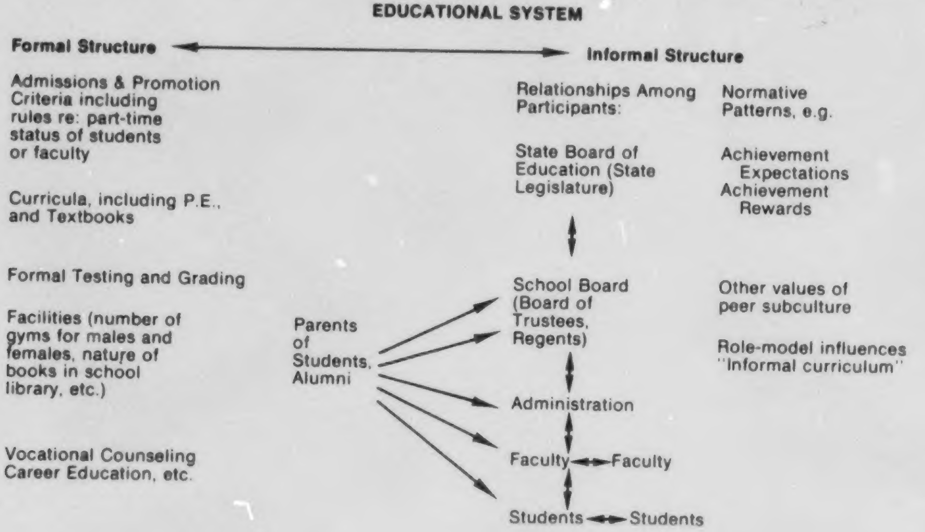

Demographic Factors:
Parents' educational & occupational status
Race, ethnicity
Religion
Residence
a. Urban-rural
b. Regional
Parent's satisfaction with own accomplishments and desires for child's achievement
Socialization Process (social-psychological) Norm sending by, & attitude transfer from Primary group (Parents, siblings peers: significant others)
Norm-sending & influencing of attitudes by Secondary group (Larger Society):
Toy typing
Books
Media images
Role-Modeling and differential reinforcement of sex-role behavior
Symbolic Interaction
Sex-role Orientation
and
Sex Difference Stereotypes
Ego Strength
Self-Concept
Educational/ Occupational Aspirations
Educational/ Occupational Expectations
Demographic factors:
Race, ethnicity
Religion
Age
Socio-eco. status
Marital status
Pregnancy status
"Other Causes"
Behavior of "Minority" itself
Inherent biological differences
(?) Structural aspects of larger society, i.e.,
stratification system & reflection of latter in socio-economic, socio-legal, & political structures

**FIGURE 3**
Independent Variables


EDUCATIONAL SYSTEM
Formal Structure
Informal Structure
Admissions & Promotion Criteria including rules re: part-time status of students or faculty
Curricula, including P.E., and Textbooks
Formal Testing and Grading
Facilities (number of gyms for males and females, nature of books in school library, etc.)
Vocational Counseling Career Education, etc.
Relationships Among Participants:
State Board of Education (State Legislature)
School Board (Board of Trustees, Regents)
Parents of Students, Alumni
Administration
Faculty
Faculty
Students
Students
Normative Patterns, e.g.
Achievement Expectations
Achievement Rewards
Other values of peer subculture
Role-model influences "Informal curriculum"

of characteristics which are "masculine" and "feminine." Yanico (1978) has recently discussed the significance of subtle nuances in language for transmitting career information to young people, especially transmitting *attitudes* about sex-appropriate careers.

In addition to their sex-role orientation and the content of the sex difference stereotypes which they hold, individuals vary in ego strength, i.e. "such constructive qualities of the ego as resourcefulness and vitality" (Gump, 1972, p. 88). These three variables in turn shape at least three additional psychological-cognitive structures which are highly relevant for educational achievement: self-concept, educational and occupational aspirations, and educational and occupational expectations.

*Educational system.* All participants in the educational system — whether school board members, administrators, faculty, students, or students' parents — are molded by the social-psychological processes described above. Thus, the educational system does not function independently of the psychological-cognitive variables which have been identified.

Elements within the formal structure of schools which appear to function in discriminatory ways, e.g., scheduling home economics classes for girls and shop courses for boys, have been exposed in recent years (Frazier & Sadker, 1973; Harrison, 1974), and efforts have subsequently been made to change these elements. However, if young persons continue to believe that they "should not" aspire toward certain occupations or that they are not as qualified as members of the opposite sex to pursue certain occupations, sex inequalities in educational (and hence occupational) achievement will persist. Females' experience with respect to mathematics training provides a useful illustration of the interrelation of psychological-cognitive variables in producing underrepresentation of women in mathematics-related careers.

### Sex Differences in Mathematics Training: The "Critical Filter" Effect

Hilton and Berglund (1974) reported successively lower mean mathematics achievement scores for females, as compared to males, at subsequent grade levels after grade five. In addition, these researchers found significant differences by sex in *interest* in mathematics and science emerging at grade nine. Freeman (1971) has argued that changes such as these in girls' performance occur at a very significant point in time, i.e. at the time when girls become aware of what their adult status is supposed to be. Conceptions of what is "feminine" and what is "masculine" are likely to narrow at this time (Neiman, 1954), and the discipline of mathematics has been viewed as basically masculine (Feldman, 1974). Thus, one component of a girl's sex-role orientation may be that proficiency in mathematics is not appropriate for women.

Correspondingly, a sex difference stereotype may be the belief that boys do better in mathematics than do girls. Ernest (1976), who studied students in grades 2 through 12, found for the top four grades (9 through 12) that almost one-third of the sample (32 percent) believed that boys do better in math. Only 16 percent of the sample believed that girls do better in math, and 52 percent said that there was no difference. And among 27 elementary and high school teachers questioned by Ernest (1976), 41 percent felt that boys do better in math, while no one felt that girls do better. Dornbusch (1974) reported that among 1,886 high school students surveyed in San Francisco, more girls (26 percent) than boys (15 percent) attributed receipt of a poor grade in mathematics to lack of ability. Tobias (1976) has recently discussed "math anxiety" as an "I can't syndrome" resulting in math avoidance, most frequently among females. According to Tobias (1976), the problem stems from "a culture that makes math ability a masculine attribute, that punishes women for doing well in math, and that soothes the slower math learner by telling her that she does not have a 'mathematical mind' ". (p. 57)

If teachers, as well as students, accept the stereotype of mathematics as a male domain, they are likely to expect a lower level of mathematics performance on the part of females and are less likely to encourage females to pursue advanced work in mathematics. The educational system itself then becomes structured in such a way that males' achievement in mathematics is facilitated while females' achievement in mathematics is seriously impeded.

Thus, to the extent that women dislike mathematics, lack confidence in their ability to perform in mathematics, and are not encouraged to achieve in mathematics, the "critical filter" effect described by Sells (1975) will operate to cut down the percentage of women who will aspire toward careers in statistics, computer/information science, operations research, economics, or other fields which are mathematics-related.

## CONCLUSION

The principal value of the model lies in encouraging attention to factors outside the educational system itself which feed into the sexism said to characterize American education. The potential significance of such factors for specifying "the dynamics of sex-specific consequences for educational attainment" has recently been stressed by Alexander and Eckland (1974, p. 680). Although the influence on teachers and faculty of their own sex stereotypes is frequently recognized as contributing to sex discrimination in education (e.g., Safilios-Rothschild, 1974; Knight, 1973), the significance of sex stereotypes and sex role attitudes of students themselves is less often noted. Enforcement of regulations generated by the 1972 Education Amendments Act or Public Law 94-482 or a comprehensive assault on sexism within a particular school setting, as described by Harrison (1974), only deals with part of the problem.

Occupational sex segregation in the U.S. labor market continues to be pronounced. According to the 1940 census, 63 percent of all women in the labor force were in occupational categories in which 50 percent or more of the incumbents were female; by 1970, the comparable figure was about 65 percent (Brito & Jusenius, 1977). Moreover, for the most part, women continue to *aspire* to traditionally female occupations. Brito and Jusenius (1977), reporting on the National Labor Survey of young women who in 1973 stated that they expected to be in the labor force at age 35, found that only 25 percent of white college women expected to be in an atypical (i.e. traditionally male) occupation at age 35. Black college women (22 percent) and white noncollege women (19 percent) were even less likely to expect to be in an atypical occupation at age 35.

The implications for vocational education are obvious. Because of existing and future labor market opportunities, it is important that young people be encouraged to consider entering expanding fields which have not typically been entered by members of their sex. For example, a favorable job market exists and undoubtedly will continue to exist in mathematics-related fields such as statistics and computer/information science.

This may necessitate an upgrading of prevocational programs and the counseling programs in high schools, designed to make students aware of the full range of career opportunities and the courses they must take in high school in order to keep all their options open. It may also mean that some students require encouragement to make up deficiencies. There is extensive evidence that such encouragement *can* be significant for female participation and performance levels in mathematics (Carey, 1958; Poffenberger & Norton, 1963; Haven, 1971; Fox, 1974; Kundsin, 1974; Blum, 1975; MacDonald, 1976; Tobias, 1976).

Rather than serving a remedial role, however, it would be more economical if vocational educators could assist young people, particularly women, in avoiding "false starts." The author's research on women medical students (Kutner & Brogan, in press) indicated that women students were more likely than men students to have entered medical school after changing their previous occupational plans or actual employment (including "employment" as a wife/mother).

Brito and Jusenius (1977) state that "if young women are to move into all types of typically male occupations, affirmative action programs are not sufficient. It is necessary also to broaden young women's exposure to the full range of their employment opportunities" (p. 137). The same is probably true in the case of young men. Vocational educators have a crucial role to play in influencing students' sex-role orientation and sex difference/stereotypes regarding "work" — two variables which occupy a key position in the attainment process of educational equity.

## REFERENCES

Alexander, D. L., & Eckland, B. K. Sex differences in the educational attainment process. *American Sociological Review*, 1974, *39*, 668-682.

Baker, C. O., & Wells, A. Q. *Earned degrees conferred 1974-75: Summary data*. National Center for Educational Statistics (No. 77-328), Department of Health, Education, and Welfare.

Blalock, H. M., Jr. *Toward a theory of minority-group relations*. New York: Wiley, 1967.

Blum, L. The new "Women in Science" program is booming with students. *Mills Quarterly*, 1975, Summer, 14-16.

Brito, P. K., & Jusenius, C. L. Occupational expectations for age 35. In F. L. Mott et al., *Years for decision*. Columbus: The Ohio State University, 1977.

Brogan, D., & Kutner, N. G. Measuring sex-role orientation: A normative approach. *Journal of Marriage and the Family*, 1976, *38*, 31-40.

Broverman, I. K., Vogel, S. R., Broverman, D. M., Clarkson, F. E., & Rosenkrantz, P. S. Sex-role stereotypes: A current appraisal. *Journal of Social Issues*, 1972, *28*, 59-78.

Carey, G. L. Sex differences in problem solving performances as a function of attitude differences. *Journal of Abnormal and Social Psychology*, 1958, *56*, 256-260.

Dornbusch, S. To try or not to try. *Stanford Magazine*, 1974, *2*(2), 50-54.

Ernest, J. *Mathematics and sex*. Santa Barbara: University of California, 1976.

Feldman, S. D. *Escape from the doll's house: Women in graduate and professional school education*. New York: McGraw-Hill, 1974.

Fox, L. H. *Facilitating the development of mathematical talent in young women*. Doctoral dissertation, Johns Hopkins University, 1974.

Frazier, N., & Sadker, M. *Sexism in school and society*. New York: Harper & Row, 1973.

Freeman, J. The social construction of the second sex. In M. Garskof (Ed.), *Roles women play: Readings toward women's liberation*. Belmont, Calif.: Brooks/Cole, 1971.

Gump, J. P. Sex-role attitudes and psychological well-being. *Journal of Social Issues*, 1972, *28*, 79-92.

Hacker, H. Women as a minority group. *Social Forces*, 1951, *30*, 60-69.

Harrison, B. G. *Unlearning the lie: Sexism at school*. New York: Morrow, 1974.

Haven, E. W. *Factors associated with the selection of advanced academic mathematics courses by girls in high school*. Doctoral dissertation, University of Pennsylvania, 1971.

Hilton, T. L., & Berglund, G. W. Sex differences in mathematics achievement — a longitudinal study. *Journal of Educational Research*, 1974, *67*, 231-237.

Knight, J. A. *Medical student: Doctor in the making*. New York: Appleton-Century-Crofts, Inc., 1973.

Kundsin, R. B. *Women and success*. New York: Morrow, 1974.

Kutner, N. G., & Brogan, D. Sources of sex discrimination in educational systems: A conceptual model. *Psychology of Women Quarterly*, 1976, *1*, 50-69.

Kutner, N. G., & Brogan, D. R. *Female medical student careers: Health services implications* (Final Report of Grant No. HS01924). Washington, D.C.: National Center for Health Services Research, 1977.

Kutner, N. G., & Brogan, D. R. The decision to enter medicine: Motivations, social support, and discouragements for women. *Psychology of Women Quarterly*, in press.

Lopate, C. *Women in medicine*. Baltimore: Johns Hopkins University, 1968.

MacDonald, C. *Increasing women's participation in the sciences: An experiment in mathematics education*. Paper presented to the American Association for the Advancement of Science, Boston, 1976.

Neiman, L. J. The influence of peer groups upon attitudes toward the feminine role. *Social Problems*, 1954, *2*, 104-111.

Pitts, F. N., Jr. Women medical student. *Journal of the American Medical Association*, 1978, *240*, 1239.

Poffenberger, T., & Norton, D. Sex differences in achievement motivation in mathematics as related to cultural change. *Journal of Genetic Psychology*, 1963, *103*, 341-350.

Safilios-Rothschild, C. *Women and social policy*. Englewood Cliffs, N.J.: Prentice-Hall, 1974.

Sells, L. W. High school mathematics as the critical filter in the job market. In *Developing Opportunities for Minorities in Graduate Education: Proceedings of the Conference on Minority Graduate Education*. Berkeley: University of California, 1973, pp. 47-59.

Sells, L. W. *Sex and discipline differences in doctoral attrition*. Doctoral dissertation, University of California, 1975.

Tobias, S. Math anxiety. *Ms. Magazine*, September 1976, *5*, pp. 56-59; 92.

Weinberg, E., & Rooney, J. F. The academic performance of women students in medical school. *Journal of Medical Education*, 1973, *48*, 240-247.

Yanico, B. J. Sex bias in career information: Effects of language on attitudes. *Journal of Vocational Behavior*, 1978, *13*, 26-34.

# The Student as a Source of Sex Inequity in Vocational Education

KERRY MOYER
Pennsylvania Department
of Education

## INTRODUCTION

Student attributes which directly influence career choice are of direct interest to all educators; occupational status is one of the most crucial indicators of the individual's overall social welfare throughout life. Life style, social environment and social mobility are chiefly determined by one's occupation. Further, the student's occupational desire is a basic ingredient in the choice of an educational program in secondary school and plans for postsecondary education. Four specific student attributes were addressed in this study: (1) the student's career aspiration, (2) the student's career expectation, (3) the student's attitude toward the world of work and (4) the student's knowledge of the requirements of various occupations. The purpose of this research was to describe these four student attributes among eleventh grade students in Pennsylvania using data collected through the statewide Educational Quality Assessment Program (EQA). More specifically, this discussion focuses upon differences, when observed, between eleventh grade female and male student questionnaire and test item responses. It is important for the vocational education community to know if female and male students comprise differing populations regarding occupational and, thus, educational choices.

Results of this research are presented separately for each student attribute studied. Emphasis throughout the study was upon differences between male and female student responses. The causes of the observed differences were not addressed; nor was the relationship between the educational system itself and the student responses studied.

## SAMPLE

The data examined were drawn from student responses to questionnaires and test scores obtained by the EQA in years 1974, 1975 and 1976. Only eleventh grade student responses were studied to keep the scope of this report manageable and because eleventh grade students exhibited more stable and realistic career aspirations and expectations than did students from earlier grades.

During the three year period between 1974 and 1976, all high schools in the Commonwealth of Pennsylvania participated in the EQA program, one-third of all districts participating each year. In total, 147,813 eleventh grade students were tested during this three-year interval. Because of the large number of students tested, stratified systematic subsamples were drawn for convenience in performing complex statistical analyses. An ideal sample size for the study of individual students was computed to be approximately 3,500. Exact figures for each year studied are provided in Table 1.

---

KERRY MOYER is a Research Associate, Department of Education, Commonwealth of Pennsylvania.

### TABLE 1
Sample Sizes of EQA Testing Programs in Pennsylvania for Selected Years Described by Sex

| | | Academic Year | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1973-74 | | 1974-75 | | 1975-76 | |
| | | Number | % | Number | % | Number | % |
| Test Sample | Total | 47,042 | | 60,129 | | 40,642 | |
| | Female | 23,583 | 50.1 | 27,485 | 45.7 | 18,212 | 44.8 |
| | Male | 22,527 | 47.9 | 29,120 | 48.4 | 19,553 | 48.1 |
| | Not Given | 932 | 2.0 | 3,524 | 5.9 | 2,877 | 7.1 |
| Analytic Sample | Total | 3,568 | | 3,313 | | 3,311 | |
| | Female | 1,809 | 50.7 | 1,714 | 51.7 | 1,702 | 51.4 |
| | Male | 1,747 | 49.0 | 1,549 | 46.8 | 1,515 | 45.8 |
| | Not Given | 12 | 0.3 | 50 | 1.5 | 94 | 2.8 |

### TABLE 2
Occupational Fields Desired by Eleventh Grade Students Reported by Sex of Respondent
(N = 3568)

| Occupational Field | Total Response | Percent of Total Sample | Male Responses | Female Responses | Percent Female of Total Response |
|---|---|---|---|---|---|
| Health | 557 | 15.61 | 152 | 405 | 72.71 |
| Education | 227 | 6.36 | 51 | 176 | 77.53 |
| Industry-Factory | 103 | 2.89 | 94 | 9 | 8.74 |
| Construction | 297 | 8.32 | 278 | 19 | 6.40 |
| Transportation | 197 | 5.52 | 106 | 91 | 46.19 |
| Communication-Public Utility | 76 | 2.13 | 46 | 30 | 39.47 |
| Services | 414 | 11.60 | 257 | 157 | 37.92 |
| Environmental Services | 189 | 5.30 | 153 | 36 | 19.05 |
| Clerical | 391 | 10.96 | 21 | 370 | 94.63 |
| Sales | 32 | 0.90 | 21 | 11 | 34.38 |
| Business | 166 | 4.65 | 101 | 65 | 39.16 |
| Professional and Technical | 714 | 20.01 | 398 | 316 | 44.26 |
| Special | 84 | 2.35 | 4 | 80 | 95.24 |
| No Response | 109 | 3.06 | 65 | 44 | 40.37 |
| Sex Not Reported | 12 | 0.34 | | | |
| TOTALS | 3,568 | 100.0 | 1,747 | 1,809 | 50.87 |

## FINDINGS

### Sex Differences in Occupational Aspirations

The eleventh grade students identified, from a list of 145 specific occupations, that one occupation most like the one "They wish to follow when finished in school." The 145 occupations were grouped into 12 major occupational fields: health, education, industry-factory, construction, transportation, communication-public utility, services, environmental services, clerical, sales, business and professional-technical. Student occupational desires are reported in Table 2 for the 1974-75 academic year.

More females than males desired jobs in the health, education and clerical fields. In fact, about 53 percent of all females desired jobs in one of these three fields. About the same number of males and females desired jobs in the communication, professional-technical and transportation fields; however, most females desired to enter the transportation fields as stewardesses. Few female students desired to have jobs in the communication, environmental services or business fields. In general, almost no female students reported a desire to enter the industry-factory, construction or sales occupational fields. Only four percent of all female eleventh grade students desired the role named "housewife."

Few males reported a desire to enter the education or communication-public utility occupational fields. Almost no males desired to enter the clerical or sales fields. In general, male students desired a wider range of occupations than did female students.

Of the total number of students surveyed, 49.3 percent aspired to an occupation which they knew required formal training (excluding apprenticeship). Specifically, about 47 percent of all male students and 52 percent of all female students desired occupations which require formal postsecondary education.

Generally, these eleventh grade students showed rather conventional and traditional male-female occupational differences: males were more prone to desire practical, physical, psychomotor or managerial type occupations; females tended to desire supportive, clerical and socially oriented occupations.

### Sex Differences in Occupational Expectations

The eleventh grade students did not display any lack of occupational expectation. And, for the most part, students were optimistic about realizing their occupational desires. Table 3 shows the percentages of all students, female students and male students who expected to enter one of the 12 occupational fields. About five percent of all students did not give an expected occupation — up slightly from the three percent of the same group of students who gave no desired occupation.

For female students, the health, clerical, education, "special" (housewife) and professional-technical fields accounted for 77 percent of all expected occupations. For male students, the professional-technical, services, construction, industry and business fields accounted for 66 percent of all expected occupations. In each case it is clear that students tended to respond to certain occupational labels possibly because of high visibility, frequent contact or glorification in the media. Although the kinds of jobs expected by female and male students differed, the tendency for all students was to choose those occupational labels which are most familiar. Job titles in certain occupational fields (especially industry-factory) which are not familiar to the student were not expected by any students (i.e., metal filer, inspector of vehicles, dispatcher).

## TABLE 3
## Occupational Fields Expected by Eleventh Grade Students Reported by Sex of Respondent
(N = 3568)

| Occupational Field | Total Response | Percent of Total Sample | Male Responses | Female Responses | Percent Female of Total Response |
|---|---|---|---|---|---|
| Health | 470 | 13.17 | 121 | 349 | 74.36 |
| Education | 242 | 6.78 | 63 | 179 | 73.97 |
| Industry-Factory | 172 | 4.82 | 157 | 15 | 8.72 |
| Construction | 283 | 7.93 | 274 | 9 | 3.18 |
| Transportation | 126 | 3.53 | 79 | 47 | 37.30 |
| Communication-Public Utility | 78 | 2.19 | 52 | 26 | 33.33 |
| Services | 410 | 11.49 | 277 | 133 | 32.44 |
| Environmental Services | 153 | 4.29 | 132 | 21 | 13.72 |
| Clerical | 416 | 11.66 | 23 | 393 | 94.47 |
| Sales | 47 | 1.32 | 31 | 16 | 34.04 |
| Business | 190 | 5.32 | 128 | 62 | 32.63 |
| Professional and Technical | 525 | 14.71 | 312 | 213 | 40.57 |
| Special | 260 | 7.29 | 2 | 258 | 99.23 |
| No Response | 184 | 5.16 | 96 | 88 | 47.83 |
| Sex Not Reported | 12 | 0.34 | | | |
| TOTALS | 3,568 | 100.0 | 1,747 | 1,809 | 50.87 |

## TABLE 4
## The Realism of Occupational Goals of Eleventh Grade Students in Terms of Actual and Projected Labor Needs

| | National | | | State | | |
|---|---|---|---|---|---|---|
| Category | Percentage Desired by All Students | Percentage of Actual Jobs in 1974 | Percentage Projected for 1985 | Percentage Desired by Students | Percentage of Actual Jobs in 1974 | Percentage Projected for 1985 |
| Professional & Technical Workers | 49.2 | 14.4 | 15.5 | 48.6 | 13.8 | 14.2 |
| Clerical | 12.0 | 17.5 | 19.5 | 11.3 | 18.0 | 19.3 |
| Managers, Officials & Proprietors | 12.3 | 10.4 | 10.5 | 3.6 | 9.1 | 9.1 |
| Service Workers | 4.8 | 13.2 | 14.1 | 11.7 | 12.0 | 12.6 |
| Sales Workers | 2.0 | 6.3 | 6.1 | 0.9 | 6.3 | 6.2 |
| Craftsmen | 10.2 | 13.4 | 13.3 | 11.2 | 14.0 | 14.0 |
| Operatives | 4.1 | 16.2 | 14.7 | 3.3 | 19.9 | 18.6 |
| Laborers | 2.9 | 5.1 | 4.6 | 0.7 | 5.2 | 4.8 |
| Farm Workers | 1.4 | 3.5 | 1.8 | 1.3 | 1.7 | 1.2 |

Source: National Center for Educational Statistics, Bulletin #26, 1977.

## Realism of Occupational Expectations

A picture of the occupational expectations of students when compared to the 1974 labor force composition and to the 1985 projections is provided in Table 4.

The Pennsylvania figures mirror the national figures closely with the exceptions of the expected numbers of managers, officials and proprietors. Relatively large discrepancies between occupational goals and occupational possibilities were seen for all categories except service workers and farm workers in Pennsylvania. Although 22 percent of Pennsylvania's students believed they will not work within their desired occupational fields, this percentage of students with unrealized occupational expectations will be much higher according to the national statistics. Females reported expecting to enter what have traditionally been considered male occupations in the professional-technical, education, health and business occupational fields. However, no reverse of this trend was evident. Males were not expecting to enter the traditionally female occupations such as nursing, secretary, housekeeping, or, in any significant numbers, teaching and social work.

## Sex Roles in Choice of An Occupation

Why does a student choose one of the 145 listed occupations on the EQA as desired or expected? Does this process of occupational choice differ for male and female students? Two probable influences upon occupation aspirations were studied: (1) the student's performance in school and (2) the student's family background.

The single largest influence on the student's expected occupational choice was what the student desired to do. While the relationship between what is desired and what is expected was highly significant it is not easily explained. Perhaps what the student desires determines what the student expects to attain in the world of occupations. On the other hand, the job desired by the student may be highly influenced by what the student expects to attain; that is, the student may practically limit occupational choice to those jobs which seem possible to attain given one's hopes, limitations, motivations, parental expectations and a variety of other personal considerations. Most likely, the choice of occupation is made using both occupational desire and expectation, balancing the decision using the student's present situation and perceptions of the world of work.

Of the variables surveyed by the EQA, the three stongest influences upon the student's desired occupational choice were, in order of influence: (1) expected occupation, (2) achievement in school and (3) the type of community (rural-urban) in which the student lives. However, the expected occupation, achievement in school and place of residence for each student were themselves so closely related that a very good prediction of the occupational desire of a student can be made solely from that student's occupational expectation. Achievement and place of residence were far less influential upon the choice of desired occupation than was occupational expectation. Generally, students who desired jobs which pay well and require postsecondary education were those students who expected to get those jobs, obtained the highest achievement scores on the EQA and lived in urban areas of Pennsylvania. While the influences on choice of desired occupation appeared the same for females and males, the occupational aspirations differed because male and female students have learned to expect different types of occupations. Therefore, the observed differences between male and female occupational desires appear not to be based upon differing career choice procedures but on differing expectations of occupations available to males and females. The family environment (father's occupational level, mother's educational level, place of residence and parental attitude toward school) showed consistent influence upon the student's occupational choice.

Very few students desired to enter the occupational field of their father; about 15 percent of the male students and 8 percent of the female students desired to enter their father's occupational field. In fact, the occupation of the father (regardless of occupational field) had a very small influence on the student's choice of desired occupation. *On the average* students desired occupations with higher pay and educational requirements than the occupations of their fathers. For all students, 49 percent desired jobs with less pay and educational requirements than their father's occupation and 51 percent desired occupations with higher pay and educational requirements than the occupation of their father.

Why did students choose an occupation which differed greatly from their father's occupation in terms of pay and educational requirements? For males, the single largest factor examined was achievement in school. Those male students who received the highest scores on the EQA math and verbal achievement scales consistently desired occupations with better pay and educational requirements than the occupations of their fathers. Further, those male students who received low EQA achievement scores generally desired occupations which paid less and had fewer educational requirements than their father's occupation. This relationship also holds for female students; however, the relationships between occupational desire and school achievement was much stronger among male students than among female students.

A second significant influence on career choice was self-esteem. As with achievement scores, the EQA self-esteem score was significantly related to the difference between the student's occupational aspirations and the occupation of the father. Again, this relationship was stronger for males than females. Male students with the lowest self-esteem scores were also those male students who desired jobs which pay less and have lower educational requirements than the occupation of their father. Male students with above average self-esteem scores desired occupations with pay scales and educational requirements far above those of their father's occupation. However, given equal self-esteem scores, female students reported lower career aspirations than did the male students.

Male-female student differences on choice of *expected* occupation were also significantly influenced by achievement in school and self-esteem. Male students who expected to enter occupations with greater pay and educational requirements than the occupations of their father were those students with the highest EQA achievement and self-esteem scores. Female students who expected to attain an occupation with higher pay and educational requirements than the occupation of their father were those with only the very highest EQA achievement and self-esteem scores. However, those female students with the very lowest EQA achievement and self-esteem scores were also those female students with the very lowest occupational expectations. Female students with only the very highest achievement and self-esteem scores expected to enter occupations with greater pay and educational requirements than the occupation of their father; most females with average and above average achievement and self-esteem scores did not choose occupations with higher pay and educational requirements than those of their father's occupation. However, it may be somewhat misleading to compare the expectations of female students with occupations of their fathers; comparing a female and male group will show lower expectations for the female group.

In summary, the occupational desires of eleventh grade students in Pennsylvania were highly related to schooling effects, especially basic skills achievement and self-esteem. The EQA data revealed that occupational desires of male students were consistently related to achievement and self-esteem; female students appeared to be most influenced by expectation of careers available to them. Male and female students at the eleventh grade level appeared to make career choices based upon the same school and family factors. However, differences in male and female student occupational aspirations at this level of schooling followed a well established pattern of occupational sexual stereotyping.

### Sex Differences in Vocational Attitude Scores

Goal VIII of Pennsylvania's Ten Goals of Quality Education reads:

> "Quality education should help every child understand the opportunities open to him or her to prepare for a productive life and help each child to take full advantage of these opportunities."

Accordingly, Section VIII of the Educational Quality Assessment is divided into two sections: Career Attitude and Career Awareness. Career attitude has two divisions: (1) Work Attitude, defined as "Willingness to give best efforts on a job, and belief that work leads to a sense of accomplishment in one's self," and (2) Career Planning, defined as "Acceptance of the necessity of vocational planning and willingness to engage in career planning activities." Career awareness is described as "Knowledge of the duties, training, salary and educational requirements of various occupations."

Examples of survey items from the work attitude (a) and Career planning (b) EQA subscales follow:

(a) The prospect of working most of my adult life depresses me.
(b) My planning for a career is a waste of time.

(1) agree (2) mostly agree
(3) mostly disagree (4) disagree

Options (1) and (2) are unfavorable responses and options (3) and (4) are favorable responses. The student score on this subscale is expressed as a total percentage of favorable responses. Thus, the Career Attitude subscales are criterion-referenced rather than norm-referenced. There are 28 items contained in this subscale, all of which are answered by one of the four options shown above. Results for the 1974 group are displayed as Table 5.

Overall, females averaged about four points higher on this subscale than did males, a practically and significantly important difference. Females scored higher on 12 of the 14 items under "Work Attitude" and significantly higher than males on 10 of those 12 items. Hence, females consistently earned equal or better scores than males for this section.

Generally, the percent favorable response was well over 50 percent. For item 28 males showed significantly more concern for earning power than did females. A similar pattern was noted for related item 15. Females were more concerned than males with job satisfaction and accomplishment. Item 23 and 26 deal with actual work practices. For these items, no significant male-female differences were observed. In general, group female and male responses to the Work Attitude items were favorable to highly favorable. At least 90 percent of all students believed doing a job well is important and will be gratifying. About 90 percent preferred working to welfare as a life style.

The "Career Planning" items were not as discriminating on the sex variable as were the Work Attitude items, although 6 of the 14 items did show a significant female-male response difference. For each of these six items found significant, females scored higher than males. About 51 percent of the eleventh grade students were "uncertain about which occupation to choose," this group being equally divided into males and females. Significantly more males than females reported they would wait until out of school to decide upon an occupation, although this entire group comprised 15 percent of the total sample. Males were also significantly more concerned with an uncertain future than were females when deciding about a job. About the same number of females and males were threatened by making a definite career choice (41 percent of all students), yet 78 percent of all students had identified an occupation they wished to enter. But even at the eleventh grade level 30 percent of all students (equal numbers of females and males) reported still changing their occupational choices. While only 20 percent of all students reported not giving much thought to career choice, the significant majority of these students were male. Only 5 percent of all students felt planning for a career was a waste of time; yet 20 percent of all eleventh grade students reported not giving thought to career choice, 24 percent believed they will enter an occupation by chance, and 9 percent believed there is no need to plan for a career since "something will come along sooner or later." In each of these cases males were significantly more negative than were females.

### TABLE 5
### Responses to Vocational Attitude — Goal VIII-A, Grade 11 Section F, with Analysis of Variance for Sex

Twenty-eight items measure attitude toward work, career choice and efforts at establishing long-range and educational plans. Response options are (1) agree, (2) mostly agree, (3) mostly disagree and (4) disagree.

| | Percent Response (1) | (2) | (3) | (4) | Percent Favorable Response | Mean For Males | Mean For Females | F-Test |
|---|---|---|---|---|---|---|---|---|
| WORK ATTITUDE | | | | | | | | |
| *1. The prospect of working most of my adult life depresses me | 11 | 16 | 31 | 42 | 73 | 2.936 | 3.109 | 23.69 |
| *3. The only good part of a job is the paycheck | 12 | 18 | 32 | 38 | 70 | 2.823 | 3.085 | 53.44 |
| *4. I would not give my best efforts to a job if others at the job refused to do their best | 6 | 10 | 31 | 53 | 84 | 3.132 | 3.411 | 74.43 |
| *6. To me, the most important thing about work is the good feeling I get from it | 37 | 41 | 14 | 8 | 78 | 2.903 | 3.182 | 71.81 |
| *7. Doing a job well, day in and day out, is important to me | 55 | 37 | 5 | 3 | 92 | 3.314 | 3.530 | 66.69 |
| *10. I feel that working will give me a high sense of accomplishment | 50 | 40 | 7 | 3 | 90 | 3.225 | 3.446 | 61.56 |
| 13. If the money were not really needed, nobody would work | 22 | 24 | 26 | 28 | 54 | 2.542 | 2.601 | 2.29 |

|  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
| *15. It doesn't matter which job I choose as long as it pays well | 6 | 9 | 32 | 53 | 85 | 3.150 | 3.419 | 73.12 |
| *16. If I could live comfortably on welfare, I would not work | 5 | 5 | 21 | 69 | 90 | 3.408 | 3.673 | 87.35 |
| 18. If I won a state lottery ($10,000 a year for life), I would not work at a job | 13 | 13 | 29 | 45 | 74 | 3.052 | 3.065 | 0.12 |
| *20. I believe in working only as hard as I have to | 14 | 18 | 32 | 36 | 68 | 2.801 | 2.963 | 19.48 |
| 23. I often don't finish work I start | 5 | 10 | 35 | 50 | 85 | 3.297 | 3.296 | 0.10 |
| 26. I'm known as a good worker, no matter what the job is | 26 | 52 | 14 | 8 | 78 | 3.011 | 2.917 | 9.49 |
| *28. How much I earn is my major consideration when I look at possible occupations | 24 | 31 | 26 | 19 | 45 | 2.164 | 2.499 | 82.68 |
| CAREER PLANNING |  |  |  |  |  |  |  |  |
| 2. I am uncertain about which occupation to choose | 28 | 23 | 21 | 28 | 49 | 2.454 | 2.484 | 0.51 |
| *5. I'm not going to worry about choosing an occupation until I'm out of school | 7 | 8 | 27 | 58 | 85 | 3.198 | 3.448 | 59.78 |
| *8. I often wonder why I should try to decide upon a job when the future is so uncertain | 18 | 25 | 30 | 27 | 57 | 2.582 | 2.708 | 11.43 |
| 9. Making a definite career choice scares me | 18 | 23 | 27 | 32 | 59 | 2.730 | 2.694 | 0.82 |
| 11. I really can't find an occupation that has much appeal to me | 9 | 13 | 29 | 49 | 78 | 3.103 | 3.197 | 7.15 |
| 12. I know a great deal about the educational requirements of jobs | 16 | 32 | 29 | 23 | 48 | 2.438 | 2.343 | 6.81 |
| *14. My planning a career is a waste of time | 2 | 3 | 24 | 71 | 95 | 3.549 | 3.674 | 26.09 |
| *17. I probably will get into an occupation mostly by chance | 9 | 15 | 33 | 43 | 76 | 2.975 | 3.189 | 38.99 |
| *19. I have not given much thought to a career choice | 9 | 11 | 25 | 55 | 80 | 3.089 | 3.382 | 67.68 |
| 21. I keep changing my occupational choice | 13 | 17 | 28 | 42 | 70 | 2.972 | 2.915 | 2.20 |
| 22. I would not want to hold the same job for more than five or ten years | 6 | 10 | 35 | 49 | 84 | 3.258 | 3.262 | 0.01 |
| 24. I doubt that I could keep interested in the same job over several years | 7 | 11 | 34 | 48 | 82 | 3.239 | 3.204 | 1.10 |
| *25. There is no need to plan for a career because something will come along sooner or later | 4 | 5 | 26 | 65 | 91 | 3.401 | 3.612 | 57.85 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 27. I really don't know how to tie together my interests and abilities as they relate to a future job choice .... | 19 | 27 | 29 | 25 | 54 | 2.522 | 2.610 | 5.40 |
| * Overall | | | | | | 55.946 | 59.402 | 67.04 |

* $p < 0.001$
(Items marked by an asterisk show statistically significant male/female responses.)

Males and females in significant numbers expressed doubt, concern and difficulty with career planning. For the total sample, 51 percent of the students expressed uncertainty in choosing an occupation, 52 percent reported lacking knowledge of educational requirements of jobs, and 46 percent reported not knowing how to tie together their interests and abilities as they relate to a future job choice. Each of these groups was composed of almost equal numbers of males and females. Hence, both sexes expressed similar difficulties with the career planning process.

### Sex Differences in Vocational Knowledge Scores

EQA Goal VIII-K, section G, measures the student's knowledge of the duties, training, salary and educational requirements of various occupations. Two types of items were used: matching and multiple choice. The initial 15 items required the respondent to match occupation titles with appropriate occupation descriptions (duties, attributes, educational requirements, psychomotor needs, etc.). The remaining 20 items were multiple choice questions all of the form:

1. Today there is a great need for, and short supply of, women in
   (a) law enforcement
   (b) teaching
   (c) construction
   (d) retail sales

The student's score is the number of correct responses out of the 35 possible points. This is a norm-referenced scoring procedure.

The average score on the vocational knowledge test for all students was about 16 (a student usually answers 16 of the 35 questions correctly). The average number of questions answered correctly by female students is 16.8 and by male students 15.8. These total score averages for male and female students were significantly different at the 0.001 level ($F = 24.61$, $df = 1,3266$). In other words, for the Vocational Knowledge EQA subscale, female students averaged one more correct answer than did male students. However, as a group, female students answered about 48 percent of all questions correctly and male students answered about 45 percent of all questions correctly. Although female students answered more questions correctly than did males, both groups answered less than half the vocational knowledge questions correctly.

Females showed superior ability over males in matching job titles with job descriptions. The most known occupational requirements for this sample were (1) lawyer, (2) salesman, (3) mailman, (4) drill press operator, (5) teacher, (6) decorator, (7) principal, (8) practical nurse, (9) dietician, (10) newspaper editor, (11) dentist, (12) registered nurse, (13) sculptor, (14) insurance investigator and (15) funeral director. It would appear that most visible occupations are the best known to the students.

Male-female differences for the 20 multiple choice items followed specific patterns. Males consistently scored significantly higher on those items which generally dealt with working conditions, salaries, and unemployment statistics. Females consistently scored significantly higher on those items dealing with employment opportunities and abilities required for specific occupations. No differences were observed on those items dealing with job aptitudes, job benefits and specific requirements for general occupation fields. Both sexes scored very poorly on items dealing with future employment opportunities, the number and kinds of jobs in the total work force and unemployment rates for teenagers.

In general, it appeared that students deal with the world of work in terms of what is most familiar to them and what is perceived to be true at present. There appeared to be little student ability to deal with employment opportunities and requirements in the future — even though the majority of students will be entering the labor force or job market in the future.

## SUMMARY AND DISCUSSION

The sexual inequalities observed on several variables in this study share a multitude of inputs and inter-relationships. However, one thought holds constant: the student body itself is a source of vocational inequity. Emphasizing the role of the individual when studying sex differences in vocational education is an important initial step.

Results of this study revealed that the internal structure of the student played a significant role in occupational choice. Of more importance was the realization of how the internal structures of male and female students differed on the variables observed. Also, study findings made quite clear how these male/female internal differences led to other observed differences. For instance, levels of self-esteem and achievement measured in males and females played a differing role in occupational aspirations and expectations. Female students appeared to accept a lower locus of control than did male students in choosing a vocational role. This was further confirmed by comparing reported career aspirations with career expectations. Female students reported aspirations nearly as high as those of males; however, female expectations were lower than male expectations. Both female and male students still very much accepted the traditional sex roles and stereotypes when choosing a career. While female students reported increased aspirations in traditionally male-dominated occupational fields, male students revealed no such movement toward traditional female-dominated fields. Perhaps the tradition of "masculine" occupations will be easier to overcome than the tradition of "feminine" occupations.

Male and female students also differed significantly in their response to items measuring attitudes toward work. Male students showed a higher level of concern for earning power and job security than did female students, and female students reported greater concern for job satisfaction and accomplishment than did male students. Career planning patterns were virtually the same for male and female students, despite significantly different career aspirations between these groups. Both sexes expressed difficulties with the career planning process.

Female students responded correctly to vocational knowledge items more often than did male students. However, female and male students differed significantly on types of items answered correctly. Female students were more cognizant of employment opportunities and abilities required for specific occupations while male students were more cognizant of working conditions, salaries and unemployment statistics.

Observing the individual student when studying sex inequity in vocational choice is the more empirical method of determining the source of the inequity, although the choice of specific variables for study remains a crucial problem. The individual is the basic unit of study because perceptions of inequality, level of sexual stereotyping, and consequence of discrimination always varies over individuals. Also the student's perception of inequality, stereotyping, or discrimination affects external behavior. Monitoring such behavior is an ingredient in the planning and implementing of the vocational education process. It is very likely that observed changes in student perceptions and behavior will lead to changes in vocational programs.

# Sex-Role Perceptions of Vocational Educators: A Variable in Achieving Sex Equity

JENNETTE DITTMAN
University of North Dakota

Human equality is one of the basic values upon which our nation was founded. Yet, equal opportunities for females and males in vocational education have as yet to be realized. The Congressional Hearings on Sex Discrimination and Sex Stereotyping in Vocational Education (1975) provided ample evidence of the existence of pervasive sex discrimination throughout the entire vocational education system. This social injustice continues in spite of laws such as the Equal Pay Act of 1963, Civil Rights Act of 1964, Equal Employment Act of 1972 and Title IX of the 1972 Education Amendment Act which have been enacted to provide legal protection against sex discrimination. Recognizing the importance of these issues, the Education Amendments of 1976 have incorporated throughout a theme of eliminating sex discrimination, bias, and stereotyping in vocational education. Not only must the mandated policies be met, but affirmative action must be taken by vocational educators to assure equal access to programs by females and males, overcome sex discrimination in programs and occupations, encourage enrollment in non-traditional courses, and provide inservice training for guidance counselors in non-sexist counseling.

These provisions have raised critical questions with state boards, agencies and schools on how to meet the requirements to provide open and equal vocational education opportunities for all students. Outright and blatant examples of discrimination may be dealt with expeditiously and eliminated through legal means. However, convincing evidence exists that students are continuing to experience differential treatment and opportunities based on their sex. Vocational educators must look deeper and perhaps in new ways at their assumptions and practices if these inequalities are to be fully corrected. The conceptual model suggested by Kutner and Brogan (1976) has presented a framework which may be useful to examine pertinent variables which appear to contribute to sex discrimination in vocational education and perhaps more importantly, has provided the means of clarifying relationships among variables.

There is ample evidence that sex discrimination does exist in vocational education with subsequent sex inequalities in vocational education opportunities and achievement (Congressional Hearings on Sex Discrimination and Sex Stereotyping in Vocational Education, 1975; Parrott, 1975; Project on Equal Education Rights, 1978; Steele, 1974; Steiger, 1975). These same sources indicate that inequalities have in turn provided pre-conditions for sex inequalities in occupational opportunities and attainment. If prediction and control of these inequalities are to be achieved, changes must be made in the independent variables presented in the model.

## EDUCATIONAL SYSTEM

Sex-role perceptions are an integral part of the educational system in which vocational education takes place. These perceptions can be a

---

JENNETTE DITTMAN is Associate Professor in Home Economics Education at the University of North Dakota, Grand Forks, North Dakota.

significant source of sex bias, thus reflecting the underlying assumptions held by individuals about sex roles and sex differences. If these assumptions are based on stereotyped perceptions of maleness and femaleness, students will continue to be restricted in their individual development and vocational education opportunities.

Sex bias has been expressed in the formal vocational educational structure through restrictive enrollment practices, counseling practices, vocational guidance tests, curricular offerings, learning resources, and staffing patterns (Congressional Hearing on Sex Discrimination and Sex Stereotyping in Vocational Education, 1975; National Institute of Education, 1974; Project on Equal Education Rights, 1978). Specific and observable discriminatory acts are illegal and are being changed. For example, students have the legal right to enroll in any vocational program; however, this has essentially been true for most programs in the past. Kaufman (1975) concluded after ten years' involvement in various vocational education projects, that doors have been open for males and females to enter nontraditional programs, but they had not and were not going through these doors to any great extent.

Sex bias reflected in schools' informal day-to-day activities and interactions are restricting students' vocational opportunities and achievement as effectively as the formal barriers. Stereotyped sex-role perceptions have acted as a screen preventing educators from being aware of the sources of discrimination in their own behaviors and in schools' programs, practices, and policies. Informal counseling of students into programs which fit traditional sex-role vocational expectations and the absence of counseling to help students evaluate their views of changing sex-roles in relation to widened curricular and vocational options have been frequently cited as evidence of practices which lead to unequal vocational opportunities and achievement. Teachers exert overt and covert pressure upon those who depart from the traditionally accepted sex-role vocational expectations. These students are often "hassled" by both teachers and their peers. In addition, in many cases, direct and indirect messages are conveyed that females need not and should not have serious career aspirations (Kaufman, 1975; Parrott, 1975; Pierce, 1975; Roby, 1975; Steele, 1975; Steiger, 1975).

## INTERNAL PSYCHOLOGICAL COGNITIVE STRUCTURES

A variable cited in the Congressional Hearings as being critical to the elimination of sex discrimination in vocational education was the stereotyped sex-role perceptions held by educators. These perceptions form a body of assumptions about sex roles and sex differences which unavoidably affect all aspects of students' educational experiences. A student's perceptions of what it means to be a male or female is also a crucial variable in the process of sex discrimination. Kutner and Brogan (1976) have suggested that sex-role orientation occupies a key position in the model and that changes in that variable will utimately affect all other variables in the system.

The commonly used concept, sex-role stereotypes, has been subdivided by Kutner and Brogan into the two constructs, sex-role orientation and sex difference stereotypes. Both are important components in an individual's internal psychological-cognitive structure and are significant components in the formation of individuals' self concepts and ego strength. All these constructs inter-relate to affect the educational and occupational aspirations and expectations of students. Thus, one's perceptions of societal expectations for appropriate male-female behaviors and one's perceptions of differences between males and females are pivotal variables in the chain of factors that relate to produce sex discrimination and inequalities in vocational education.

The literature on sex roles and sex-role stereotyping produces extensive evidence which raises questions about the viability of traditional sex-role perceptions based on the view that masculinity and femininity are complementary bipolar qualities. Rather than emphasizing the differences between the sexes, a number of researchers and writers have suggested that the relationship between sex roles and personality be reframed so that similarities and commonalities shared by the sexes may be investigated (Bardwick, 1974; Bem, 1974, 1976; Kaplan & Bean, 1976; Rebecca, Hefner & Oleshansky, 1976).

Bem (1974, 1976) has proposed the model of androgyny as a more flexible and humanistic framework from which to examine individual personality. Using this model, individuals may incorporate into their personalities and express both the traditionally assigned masculine and/or feminine characteristics, depending on the situational appropriateness of these behaviors. Thus, individuals would be freed to develop their own unique qualities and interests unhampered by the restrictions of rigid sex-role stereotypes.

Bem's research has produced evidence verifying and validating the model of psychological androgyny (Bem, 1974, 1976). The development and use of the Bem Sex-Role Inventory (Bem, 1974) has provided an operational definition of androgyny and produced evidence confirming the existence of androgynous individuals (Bem, 1974, 1976).

## SEX-ROLE PERCEPTIONS OF VOCATIONAL EDUCATORS

Research has shown that teachers', counselors', and administrators' attitudes and values are a significant influence upon students (Leacock, 1969; Minuchin, Biber, Shapiro & Zimiles, 1969; Brophy & Good, 1970; Rosenthal & Jacobson, 1968). Expectations and attitudes concerning appropriate sex-role behaviors are conveyed through the reinforcement or non-reinforcement of sex-stereotyped behaviors (Lee & Kedar, 1974). Differing expectations are held for male and female students which influence the intellectual, social, and emotional development of students (Ricks & Pyke, 1973; Sadker & Sadker, 1974; Steele, 1974). Testimonies in the Congressional Hearings on Sex Discrimination and Sex Stereotyping in Vocational Education (1975) cited the stereotyped sex-role perceptions of vocational educators as a factor crucial to te elimination of sex discrimination. The lack of specific research data on which to base the planning and implementing of corrective measures was also presented as an important impediment to reducing inequalities in vocational education. Kutner and Brogan stated, "as attitudes about appropriate behavior for females and males become more flexible, all other variables in the system will correspondingly be affected" (1976, p. 67). Knowledge of educators' sex-role perceptions is a necessary first step to predicting and controlling inequalities in vocational education. The study which follows (Dittman, 1976) sought to provide empirical data concerning the sex-role perceptions of vocational educators in North Dakota.

## PROCEDURE

A stratifed random sample of 517 was drawn from the population of 1,860 vocational teachers, counselors, and administrators in North Dakota. The final sample was composed of 396 educators of 76.6 percent of those originally contacted.

The Bem Sex Role Inventory (BSRI) (Bem, 1974) was selected to assess the sex-role perceptions of the vocational educators in this study. The BSRI was developed to measure individuals' perceptions of their own sex-roles. It has also been used to assess individuals' perceptions of others' sex roles (Campbell, Katrin & Newman, in process; Deutsch & Gilbert, 1976). Vocational educators in this study were asked to mark the BSRI three times to indicate their sex-role perceptions of themselves, an adult male, and an adult female.

Normative data for the BSRI are based on its administration to more than 2000 undergraduate college and university students. The Masculinity scores and Femininity scores are empirically, as well as conceptually, independent (average *r* = −.03). The T-ratio is internally consistent (average *r* = .93), and uncorrelated with the tendency to describe oneself in a socially desirable direction (average *r* = −.06).

The BSRI contains 20 masculine, 20 feminine and 20 neutral adjectives. Means are calculated for each subject's ratings of the masculine and feminine adjectives producing a masculinity and a femininity score. The difference between the Masculinity Score and the Femininity Score is used to calculate the Androgyny (*t*-ratio) score. The greater the absolute value of the androgyny score, the more sex-typed a person is. The closer the score is to zero, the more androgynous a person is. Cut-off points for classifying subjects in terms of the Androgyny (*t*-ratio) score are presented in Table 1 (Bem, 1974).

**TABLE 1**
Bem's Sex Type Classification Using the Androgyny (t ratio) Score

| Sex Type Classification | Androgyny (*t* ratio) Score Cut-Off Points |
|---|---|
| Feminine (f) | $t \geq 2.025$ |
| Near feminine (nf) | $1 < t < 2.025$ |
| Androgynous (a) | $-1 \leq t \leq +1$ |
| Near masculine (nm) | $-2.025 < t < -1$ |
| Masculine (m) | $t \leq -2.025$ |

(Bem, 1974, p. 161)

## RESULTS OF THE STUDY

Data from the study produced evidence that the vocational educators in the study sample were highly consistent in their sex-role perceptions of males and females. These perceptions did not differ significantly according to the subjects' sex, occupational group, program area specialty, or school level employed (secondary or post-secondary).

Subjects in all sub-samples viewed males as masculine typed and females as feminine or near-feminine typed indicating predominantly stereotyped views of others' sex roles (Tables 2 and 3). As noted in the Kutner and Brogan model, these perceptions could be a significant source of sex discrimination in the formal and informal structure of schools as vocational educators plan and carry out their programs.

**TABLE 2**
Sex-Role Perceptions of Males, Females, and Self by Male Subjects and Female Subjects

| Sex | n | Mean A-Score Self*[a] | n | Mean A-Score Males[a] | n | Mean A-Score Females[a] |
|---|---|---|---|---|---|---|
| Males | 296 | −1.846 (nm) | 297 | −3.090 (m) | 296 | 2.300 (f) |
| Females | 97 | 0.380 (a) | 96 | −3.342 (m) | 97 | 1.947 (nf) |

[a] Letters in parentheses indicate sex type classifications using Bem's suggested cut-off points. (See Table 1)

* $p < .05$

**TABLE 3**
Sex-Role Perceptions of Males and Females by Teachers of Various Program Area Specialties

| Program Area Specialty | n | Mean A-Score Males[a] | n | Mean A-Score Females[a] |
|---|---|---|---|---|
| Agriculture | 37 | −3.146 (m) | 37 | 2.625 (f) |
| Distributive education | 22 | −3.012 (m) | 22 | 2.466 (f) |
| Home economics | 54 | −3.492 (m) | 54 | 2.038 (f) |
| Industrial arts | 36 | −3.011 (m) | 36 | 2.155 (f) |
| Office | 25 | −3.349 (m) | 25 | 2.247 (f) |
| Special needs | 18 | −3.816 (m) | 18 | 1.475 (nf) |
| Trades and industry, and health | 53 | −2.897 (m) | 53 | 2.001 (nf) |

[a] Letters in parentheses indicate sex type (Bem, 1974). (See Table 1)

Both male and female subjects described other males and females as being significantly more sex-typed than they perceived themselves to be (Table 2). The force of traditional societal sex-role norms is reflected in this finding. Although subjects in the study interpreted themselves as deviating from these norms, they assumed that others were not. These vocational educators need to be made aware of the discrepancy between their perceptions of themselves and those of others and how this difference could limit students' development and produce inequalities. The data also raise questions about the assumption that perceptions of one's own sex role are an accurate predictor of one's perceptions of other's sex roles.

## DISCUSSION

These data along with that from selected research studies using the BSRI can help to determine a more accurate picture of perceptions of contemporary sex roles (Table 4). A majority of subjects in all of these samples were viewing their own sex roles in a non-stereotyped way providing evidence that individuals are diverging in their own sex roles from traditional societal norms. The two studies using North Dakota high school students as subjects (Johnson, 1976; Sorensen, 1976) provided evidence that only 16 percent and 17.5 percent of the female students and 22 percent and 41.5 percent of the male students in these samples perceived their sex roles as expressing traditional norms. In contrast, the North Dakota vocational educators in the study conducted by Dittman (1976) perceived males and females in a predominantly stereotyped manner.

These findings when related to the Kutner and Brogan model raise questions about the relationships between the variables, students' sex-role perceptions and educators' sex-role perceptions of males and females. Although conclusions from the Dittman (1976), Johnson (1976), and Sorensen (cited in Johnson, 1976) are limited to the studies' samples and caution must be used in interpreting and generalizing from these data, the findings point to the need for additional research to investigate the congruity between the way students viewed their sex roles and the way teachers saw students' sex roles.

A study by Cattanach (1979) sought evidence to provide an answer to the question of how teachers' perceptions of students' sex roles differ from students' perceptions of their own sex roles. Home economics cooperating teachers, home economics student teachers, and their male and female students were subjects for this study. The BSRI (Bem, 1974) was used to assess subjects' sex-role perceptions.

48

### TABLE 4
### Sex-Role Classifications of Subjects from Selected Research Using the Bem Sex-Role Inventory

| Classification | North Central High School (Johnson, 1976) | | Fargo South High School (Sorensen, 1976) | | Stanford University (Bem, 1974) | | Foothill Junior College (Bem, 1974) | | North Dakota Vocational Educators (Dittman, 1976) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Males (n = 67) | Females (n = 70) | Males (n = 91) | Females (n = 105) | Males (n = 444) | Females (n = 279) | Males (n = 117) | Females (n = 77) | Males (n = 296) | Females (n = 97) |
| % Feminine | 0 | 16 | 0 | 17.5 | 6 | 34 | 9 | 40 | 3 | 14.5 |
| % Near feminine | 9 | 24 | 3 | 30.5 | 5 | 20 | 9 | 8 | 1 | 22 |
| % Androgynous | 36 | 40 | 25.5 | 27.5 | 34 | 27 | 44 | 38 | 26 | 42 |
| % Near masculine | 33 | 10 | 29 | 15 | 19 | 12 | 17 | 7 | 22 | 14.5 |
| % Masculine | 22 | 10 | 41.5 | 9.5 | 36 | 8 | 22 | 8 | 48 | 7 |

Teachers and student teachers viewed female students' sex roles as feminine-typed, and teachers saw the sex roles of male students as masculine-typed. These perceptions thus reflected society's stereotyped norms for males and females. In contrast, female students viewed their own sex roles as androgynous while males saw themselves as near-masculine. Thus teachers and student teachers were perceiving female students and teachers were viewing male students as significantly more sex typed than students saw themselves. This discrepancy indicated that teachers were functioning with assumptions regarding students' male and female roles that were more restrictive than the perceptions the students had of their own sex roles. A similar situation appeared to exist with student teachers' views of female students. Thus, although these students saw their own sex roles in a less traditional way, the teachers' and student teachers' stereotyped views could restrict the students from developing individual qualities and interests or from exploring the expanded vocational opportunities wich are now legally open to them. In applying this to the Kutner-Brogan model, it is possible that change is one variable (students' sex-role perceptions) could be negated by the lack of change in another variable (educators' perceptions of students' sex roles). Thus, intervention measures need to be made simultaneously with both variables.

On the other hand, the study produced evidence that student teachers' perceptions of male students' sex roles (near-masculine) and the male students' view of their own sex roles (near-masculine) were not significantly different. In this situation, the student teachers had the potential to support and reinforce the male students' more flexible perceptions of appropriate male behaviors and provide experiences for them and other students to become aware of the concomitant expanded possibilities for personal and vocational development.

Data from these studies need to be viewed in relation to previous research findings that have supported the conclusion that the teacher is the most influential variable in the classroom in defining possibilities for student learning. The teacher holds the power and makes decisions which determine not only the curriculum, but also the classroom learning climate. The teacher thus has the potential to reinforce society's traditional sex-role stereotypes and keep students within the prescriptive limits or to provide opportunities for students to explore new options and develop their own individual qualities and interests unhampered by pre-ordained sex-role expectations. Teachers could provide a significant source of support for students to move in the direction of androgyny, if the teachers could see students as having this potential. As shown by the data presented, the vocational educators in the study by Dittman (1976) who viewed males and females in a predominantly sereotyped way and the home economics teachers in Cattanach's study (1979) who were seeing male and female students' sex roles as highly sex-typed were not perceiving these possibilities.

The teachers, student teachers and female students in Cattanach's study viewed their own sex roles as androgynous. The potential existed for these groups to share their personal perceptions in an atmosphere of mutual understanding and support and move forward together to expanded personal and vocational development. However, the teachers and student teachers in viewing their female students' sex roles as stereotyped could erect consciously and unconsciously effective barriers against allowing this to happen.

Educators' sex-role perceptions are an important factor in affecting other variables that produce discrimination; consequently, teachers, counselors, and administrators would be advised to become aware of their own sex-role orientation and examine sex-difference stereotypes. They need to recognize the relationship between these perceptions and other variables such as students' sex-role orientation, ego strength, self-concept and educational occupational expectations. Unless affirmative steps are taken to challenge educators in this way, sex inequalities will continue to be a reality in vocational education.

## REFERENCES

Bardwick, J. M. Androgyny and humanistic goals or goodbye, cardboard people. In M. L. McBee & K. A. Blake (Eds.), *The American woman: Who will she be?* Beverly Hills: Glencoe Press, 1974.

Bem, S. L. The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 1974, *42*(2), 155-162.

Bem, S. L. Probing the promise of androgyny. In A. Kaplan & J. Bean (Eds.), *Beyond sex-role stereotypes — Readings toward a psychology of androgyny.* Boston: Little, Brown, & Co., 1976.

Brophy, J., & Good, T. Teachers, communications of differential expectations for children's classroom performance: Some behavioral data. *Journal of Educational Psychology*, 1970, 61, 356-374.

Campbell, P., Katrin, S., & Newman, D. *Project on sex stereotyping in education.* Red Bank, N.J.: Women Educators, in press.

Cattanach, N. A. *Comparison of sex-role perceptions of home economics teachers, home economics student teachers, and their students.* Unpulished master's thesis, North Dakota State University, 1979.

Deutsch, C. J., & Gilbert, L. A. Sex role stereotypes: Effect on perceptions of self and others and on personal adjustment. *Journal of Counseling Psychology*, 1976, *23*(4), 373-379.

Dittman, J. *Sex-role perceptions of North Dakota vocational educators.* Bismarck: North Dakota Research Coordinating Unit, State Board for Vocational Education, 1976.

Johnson, J. W. *Sex-role perceptions of high school students.* Unpublished master's thesis, North Dakota State University, 1976.

Kaplan, A. G., & Bean, J. P. *Beyond sex-role stereotypes — Readings toward a psychology of androgyny.* Boston: Little, Brown, & Co., 1976.

Kaufman, J. J. *Sex discrimination and sex stereotyping in vocational education* (Testimony). In Hearings before the Subcommittee on Elementary, Secondary, and Vocational Education of the Committee on Education and, Labor. Washington, D.C.: House of Representatives, March 17; April 21, 28, 1975.

Kutner, N. G., & Brogan, D. Sources of sex discrimination in educational systems: A conceptual model. *Psychology of Women Quarterly*, 1976, *1*(1), 50-69.

Leacock, E. B. *Teaching and learning in city schools.* New York: Basic Books, 1969.

Lee, P., & Kedar, G. *Sex role and pupil role in early childhood education.* New York: Columbia University, Teachers College, 1974. (ERIC Document Reproduction Service No. ED 100 491)

Minuchin, P., Biber, B., Shapiro, E., & Zimiles, H. *The psychological impact of school experience.* New York: Basic Books, 1969.

National Institute of Education. *Guidelines for assessment of sex fairness in career interest inventories.* Washington, D.C.: Author, 1974. (ERIC Document Reproduction Service No. ED 098 314)

Parrott, R. *Sex discrimination and sex stereotyping in vocational education* (Testimony). In Hearings before the Subcommittee on Elementary, Secondary, and Vocational Education of the Committee on Education and Labor. Washington, D.C.: House of Representatives, March 17; April 21, 28, 1975.

Pierce, W. F. *Sex discrimination and sex stereotyping in vocational education* (Testimony). In Hearings before the Subcommittee on Elementary, Secondary, and Vocational Education of the Committee on Education and Labor. Washington, D.C.: House of Representatives, March 17; April 21, 28, 1975.

Project on Equal Education Rights. *Stalled at the start.* Washington, D.C.: Author, 1978.

Rebecca, M., Hefner, R., & Oleshansky, B. A model of sex-role transcendence. In A. Kaplan & J. Bean (Eds.), *Beyond sex-role stereotypes — Readings toward a psychology of androgyny.* Boston: Little, Brown, & Co., 1976.

Ricks, F. A., & Pyke, S. W. Teacher perceptions and attitudes that foster and maintain sex-role differences. *Interchange*, 1973, *4*(1), 26-33.

Roby, P. A. *Sex discrimination and sex stereotyping in vocational education* (Testimony). In Hearings before the Subcommittee on Elementary, Secondary, and Vocational Education of the Committee on Education and Labor. Washington, D.C.: House of Representatives, March 17; April 21, 28, 1975.

Rosenthal, R., & Jacobson, L. F. *Pygmalion in the classroom: Self-fulfilling prophecies and teacher expectations.* New York: Holt, Rinehart & Winston, 1968.

Sadker, M., & Sadker, D. Sexism in the schools. *Education Digest,* 1974, *39,* 58-61.

Sorensen, B. J. *Sex-role perceptions of high school students.* Unpublished manuscript, Concordia College, 1976. Cited in J. W. Johnson (Ed.), Sex-role perceptions of high school students. Unpublished master's thesis, North Dakota State University, 1976.

Steele, M. *Women in vocational education.* Project Baseline Supplemental Report. Flagstaff: Northern Arizona University, 1974.

Steele, M. *Sex discrimination and sex stereotyping in vocational education* (Testimony). In Hearings before the Subcommittee on Elementary, Secondary, and Vocational Education of the Committee on Education and Labor. Washington, D.C.: House of Representatives, March 17; April 21, 28, 1975.

Steiger, J. M. *Sex discrimination and sex stereotyping in vocational education* (Testimony). In Hearings before the Subcommittee on Elementary, Secondary, and Vocational Education of the Committee on Education and Labor. Washington, D.C.: House of Representatives, March 17; April 21, 28, 1975.

U.S. House of Representatives. *Congressional hearings on sex discrimination and sex stereotyping in vocational education.* Hearings before the Subcommittee on Elementary, Secondary, and Vocational Education of the Committee on Education and Labor. Washington, D.C: Author, March 17; April 21, 28, 1975.

# Reverse Sex Stereotyping Case in Point: Court Reporting

MARCIA A. ANDERSON and
BEVERLY A. STITT
Southern Illinois University

## INTRODUCTION

### Nature of the Problem

Vocational education is on the threshold of inclusion into the general education core, a trend clearly evidenced by the 1972 and 1976 Education Amendments. While this trend is a welcome one for vocational educators, the accompanying regulations must not be overlooked. According to Title IX of the 1972 Educational Amendments, "No person . . . shall on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance." Sections 86.21 and 86.23 state that comparable efforts must be made to recruit members of each sex. Section 86.36 states that discrimination on the basis of sex is not permitted in counseling or guiding students. Further, whenever a school finds that a class has a disproportionate number of students of one sex, it must take whatever action is necessary to assure that sex bias in counseling or testing is not responsible, as stated, "A recipient may be required to undertake additional recruitment efforts for one sex as remedial action."

Sex stereotyping is usually evidenced by women being groomed, guided, and encouraged in traditional low prestige, low income, subordinate role occupations. This has resulted in a large number of studies done to show the successes and failures in changing this pattern (Haueisen, 1975; Smith, 1976; Beach, 1977). But half the working population is male (Ellis, 1977) and they, too, may be manipulated into career choices by sex stereotyping. Usually, these manipulations are to the male advantage in that they are led to the occupations with higher prestige, higher pay, and greater leadership potential. It is evident that some progress has been made in overcoming sex stereotyping in encouraging males to consider non-traditional occupations. It is common to see male airline stewards and many hospitals employ male nurses; but the fact remains: it is difficult to convince most males that they have been denied desirable privileges, such as changing hospital bedding or typing and filing for eight hours a day. Vocational education enrollment still shows that over 90 percent of the enrollment in the areas of agriculture, technical, trade and industry is male and over 85 percent of the enrollment in home economics, office education, and helath is female (Ellis, 1977; Allen, 1976).

The desired result of non-traditional occupational experiences is not just balance, but an upgrading of the occupations as a whole in the areas of prestige, pay, and leadership potential so that individuals are attracted to the field regardless of sex. The purpose behind the new legislation

---

MARCIA A. ANDERSON is Assistant Professor and Coordinator of Business Education and BEVERLY A. STITT a Researcher, in the Department of Vocational Education Studies, Southern Illinois University, Carbondale, Illinois.

and studies, then, is to be sure that sex stereotyping is not a factor in career choice.

Members of the court reporting profession have noticed changes in the sex ratio of the student profile during the last 10 to 15 years. This occupation, which for a number of years was primarily male-dominated, seems to have become female-dominated (Karpowicz, 1977; McFate, 1978; Peppey, Glassbrenner & Palmer, Note 1). A 1973 report of a survey of court reporting schools indicated male enrollment of anywhere from 30 percent to none, with a majority reporting about 10 percent male students (McFate, 1978). Also, the only Illinois state supported court reporting program, located at the School of Technical Careers of Southern Illinois University, Carbondale, shows a 100 percent female student population. Yet professional journals include pleas for more court reporters, particularly men (Karpowicz, 1977). If this sex ratio shift is valid, here is a more easily observable case to examine for stereotyping; actually a classical example of "reverse" sex-role stereotyping may have occurred. At the December, 1977, meeting of the National Shorthand Reporters Association Board on Approved Reporter Training in St. Louis, Missouri, this phenomenon was brought up for discussion. No consensus was reached to explain the apparent shift in sex ratio during the last 10 to 15 years.

It is true that our attention has been drawn to sex-role stereotyping and sex bias primarily because of the problems experienced by women. However, it is important that we develop and maintain a balanced perspective on the elimination of stereotyping for men as well as women. Men may perceive opportunities for contribution and satisfaction in occupations dominated by females. Men as well as women may be hurt by occupational sex-role stereotyping. The goal is not to change the stereotyping, but to eliminate it and gain equality of opportunity in vocational education and employment of all students.

## PURPOSE OF THE STUDY

The purpose of the study was to analyze the phenomenon, of "reverse" sex stereotyping in vocational education; more specifically, court reporting and court reporting education in Illinois.

### Summary of Related Literature

Several general conclusions were drawn from the analysis of the literature reviewed for this study. Social psychologists were adamant that sex stereotyping is a powerful stratifier in our society. Language specialists have shown again and again the power of our language in sex-image production. Beach (1977), Ellis (1977), and others were convinced that stereotyping would not just go away. Rather, organized efforts were necessary to achieve sex fairness. Though sexism in written materials was well on its way to being eliminated, efforts needed to continue in this endeavor. Independent research and nationwide studies pointed to the overtly stereotyped guidance materials and practices. But even sex-fair materials could do little to eliminate sexist counseling practices unless they were translated into training programs for the counselor to better understand the changing roles of men and women in the world of work. Previous projects have shown that non-traditional education was successful for females and that recruitment needed to be improved over time. This should surely apply to males as well. Consequently, sex stereotyping and its effect on males needed to be examined.

It was found that the court reporting occupation had none of the traditionally stereotyped characteristics of a female occupation yet was becoming female dominated. Court reporting paid well, carried prestige, work variety, and leadership potential. Court reporting had no prerequisites or skills that were sex linked. In fact, in July, 1976, the National Shorthand Reporters Association announced the 12 new fellows of the Academy of Professional Reporters. Eleven were men. In the 1977 Stenograph contest, all eight winners were men. All articles concerning descriptions of court reporting activities were written by men.

Yet, court reporting professionals and educators reported a shortage of males and at least a 70 percent female domination in classes. The possibility of a classical example of "reverse" sex stereotyping provided an opportunity to look deeper into this phenomenon of stereotyping and to look at stereotyping from the male point of view.

## METHOD

### Project Design

In accomplishing the overall objective through the ex post facto research method, several questions became pertinent that resulted in a project design with two thrusts. The first thrust, data collection, prompted these questions:

1. What is the sex ratio of students participating in court reporter education in NSRA-approved schools in Illinois?
2. Has there been a shift from male domination to female domination in court reporting training programs in Illinois in the past 10-15 years?
3. Does the sex ratio of Question 1 and shift in question 2 correlate with the sex ratio of students in other related programs of study?

The second thrust, content analysis, prompted these questions:

4. What elements of sex stereotyping are found in recruitment material and curriculum descriptions used by NSRA-approved court reporting schools?
5. What other influences can be found that might explain the shift in sex ratio in the court reporting programs in Illinois?

### Population

Illinois has five of the approximately 70 nationally approved court reporting training programs distributed throughout the country. Three of the schools are located in the Chicago metropolitan area; one is located in the mid-state area; and one is a university-based program in southern Illinois. Two of the schools are junior colleges; two are business colleges; and one is part of a vocational school of a university. Two schools have been in operation for more than 15 years; two from 10-15 years; and one for less than four years. Three are private schools and two are public institutions. Consequently, these five schools offered a diversified population base to study.

Since the court reporting student population in these schools was generally small, it was decided to study the entire population of students and make ratio comparisons from 1966 to 1977. Also, since only five institutions were being studied, it was decided to review all recruitment materials and curriculum descriptions pertaining to the court reporting programs in these schools in the content analysis thrust.

### Instrumentation

A sex-role stereotyping evaluation tool was developed by the project staff by analyzing similar tools used in other federal and state studies and by revising and adopting segments of these tools for use in this study. The sex-role stereotyping tool was field tested and revised for use by the project advisory board in evaluating the recruitment materials, practices, and curriculum descriptions in the population studied.

### Treatment of Data

The information from the sex-role stereotyping evaluation tool as completed by the advisory board members in evaluating the school materials was coded for computer analysis. It was possible to analyze the evaluation in the following ways:

1. Item analysis of each stereotyping element including the absolute frequency of occurrence, adjusted frequency, and cumulative frequency.
2. Item analysis including the mean score for each piece of material evaluated.
3. Composite mean scores of each item according to the school from which the material originated.
4. Composite mean scores of each item according to the role of the evaluator, i.e., administrator, teacher, court reporter.

## ANALYSIS AND DISCUSSION OF DATA

### Sex Ratios

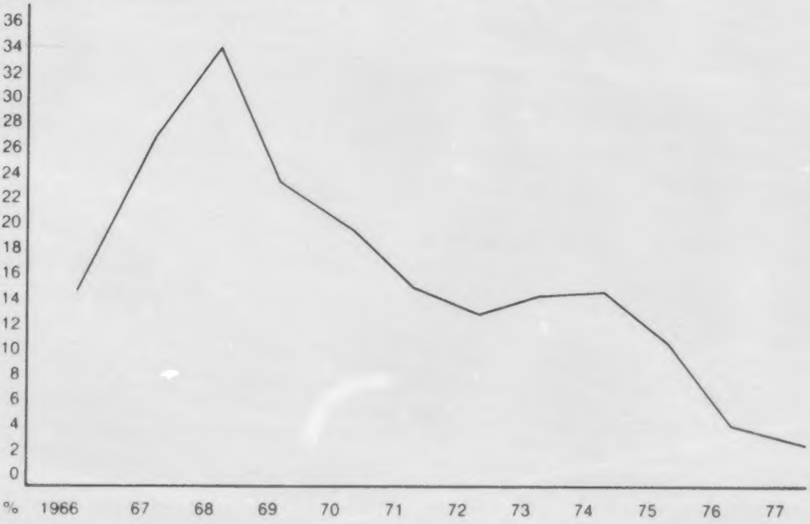
The initial research question was: What was the sex ratio of students participating in NSRA-approved court reporter training programs in Illinois? Although the figures for male enrollment changed quite radically over the 12-year period, it can be seen when percentages are computed based on the total number of applicants that there was a steady decline of males applying for certification over the year with a more extreme drop the last three years. The females achieving official certification dominated with the males showing a gradual decline by percent of the total population of those being certified after 1971, particularly the last three years.

Although females dominate in the ratio of those achieving the Certified Shorthand Reporter rating through the Illinois Office of Registration and Education, the figures prior to 1971 are closer to equalization. The same drop in males can be noted since 1975 (see Figure 3).

It can be seen that there is no appreciable difference in the sex ratio or percent of male participation in the two forms of certification in Illinois. Females radically outnumber males in certification whether

**FIGURE 1**

Percent of Males Applying for Certification



56

**FIGURE 2**
Percent of Males Achieving Official Certification

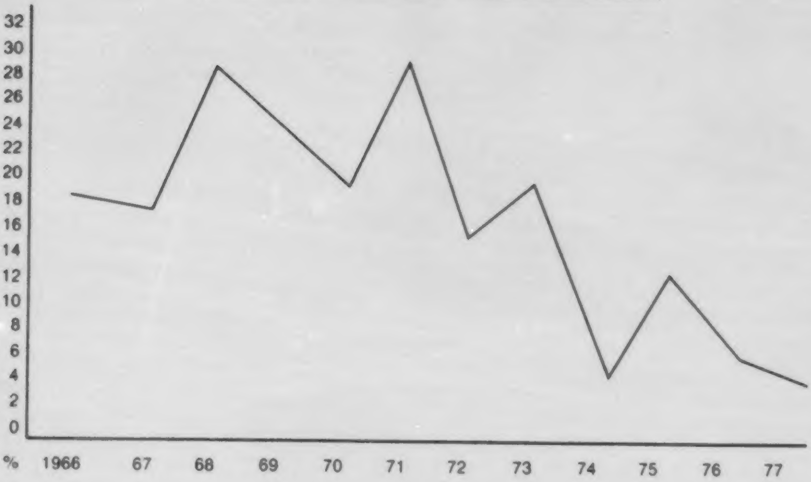
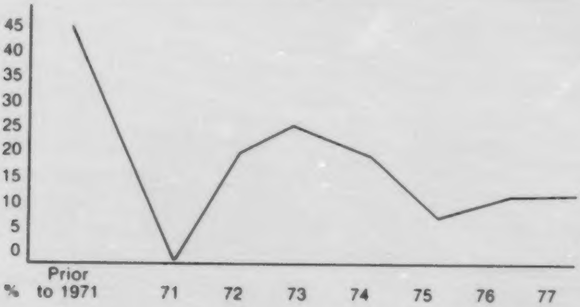


**FIGURE 3**
Percent of Males Achieving Certified Shorthand Reporter Certification



it be official certification through the Administrative Office of Illinois Courts or the Certified Shorthand Reporter certification through the Illinois Office of Registration and Education.

The second research question was whether or not a shift in sex ratio could be determined. It was not possible to empirically establish a sex ratio shift due to the lack of public records prior to 1966. Merely personal recollections of various court reporters and school staff at court reporting schools in operation for over 30 years attest to the nearly 75-80 percent male domination of the court reporting programs in the 1940's and 50's. Consequently, this study is only able to report a relatively steady decline in male percent of student population over the last 12 years with a dramatic drop in the last three years.

## Content Analysis

The content analysis research question was: Are there sex-role stereotyping elements in the recruitment materials and curriculum descriptions used by the court reporting schools that may deter males from participation in the program?

A thorough review of pertinent literature provided many examples of language evaluation tools used in studies to evaluate education materials. Particularly useful were the Women on Words and Images study (1972), the Ellis study (1977), the Awareness Project, Feminists Northwest (1976), and the Maher study (1976). Segments of these evaluation tools were revised and adopted for use in this study. A segment for use in evaluating illustrations was developed by the project staff and prepared for use by the advisory board in evaluating the school materials.

*Orientation and validation.* The board was given an orientation into awareness of sex-role stereotyping in our society followed by a more specialized presentation of how sex-role stereotyping is manifested in education materials. Following this presentation, the board was administered an evaluator's quiz to validate the board's expertise in evaluating educational materials for sex-role stereotyping. Out of the 15 questions, most evaluators missed fewer than two with an overall average error of 15 percent per evaluator.

*Evaluation of materials.* The board was supplied with copies of all the recruitment material and curriculum descriptions from participating schools. These materials included segments of college catalogs, specially prepared brochures, and new advertisements from local papers.

a. Language. Although computation of the evaluators' scoring indicated some occurrence of nearly all of the stereotyping elements, the following elements received the most significant scoring. In the language section, the reference to secretarial skills as a prerequisite to court reporting was scored in the majority level. In other words, out of all the cases where this element could appear, it was present 51-75 percent of the time. Similarly, the reference to court reporting as part of a secretarial program was scored in the majority level. Although the remainder of the language elements did not receive such significant scoring, the overall language score indicated that the language in the school materials was stereotyped enough in these two items to pull down the overall language score considerably. The overall language score indicates that nearly 60 percent of the scores fell in the 25-100 percent frequency categories.

b. Illustrations. The single element that resulted in the most dramatic statistics in the illustration section was female subjects. Other elements resulted in high frequencies such as females in leadership or authoritarian roles and females who suggest "all American girl" qualities. However, these percentages hardly approached the 67.6 percent majority frequency of the female subjects item.

This overall illustration score indicates that 70 percent of the scores fell in the 25-100 percent frequency categories. In spite of the fact that the frequency levels in all the illustration elements except female subjects were less than 30 percent, the evaluators rated illustration segments with a high frequency of stereotyping — 70.3 percent.

The analysis of the language and illustrations found in the court reporting recruitment materials and curriculum descriptions indicated that many of these stereotyping elements exist in the materials evaluated. The overall language and illustration scores indicate that materials exhibiting the elements discussed above resulted in an extremely critical overall score of the material.

*Other influences.* The advisory board discussed what other possible influences might be deterring males from court reporting education. The 11 influences the board deemed important and a summary of their recommended solutions follow.

1. Career Decision Practices

Court reporting is seldom mentioned or promoted in a career day setting. Many students have already made career decisions before learning about the court reporting occupation. Court reporting needs to be included on interest inventories.

2. Self Employment

Court reporting permits a person to be self-employed, thus appealing to self-motivated people and people who do not object to working alone.

3. Image and Attitude

Court reporting is often promoted as a career for people with the highest skills in typing and shorthand. Actually, these skills are not a prerequisite to being a successful court reporter. Typing is a necessary skill only if the reporter plans to transcribe his own notes.

4. More Women in Work Force

As the number of women in the work force increases, there will naturally be more women in court reporting education. This is particularly true in cases where the reporter desires good paying, part-time work.

5. Recruitment Practices in High School

Recruitment should be done in groups of boys and girls rather than just secretarial classes. Also, males can be role models for young men by recruiting personally.

6. Job Security

Court reporting, as a form of self-employment, offers certain risks. Men with families may seek more stable employment with a set pay scale.

7. Skill Requirements

Since the majority of reporters prefer to transcribe their own notes, typing is a desirable skill. Yet, typing is viewed as a feminine skill.

8. Curriculum

Most court reporting schools couch court reporting in their secretarial program. Court reporting would fare better with males if it were part of the management electives or data processing electives.

9. "Shorthand"

The word "shorthand" carries with it a negative female stereotype.

10. Secretarial Alternatives

Women may be more attracted to court reporting because, should they fail to achieve competency in this area, they have a socially acceptable alternative to fall back on in which they can use the skills they have mastered — secretarial work. Men, however, would hesitate to choose to become a secretary as an alternative; they would need to choose a completely different career if they failed to achieve mastery of court reporting skills.

11. Reaching the Male Audience

The board noted that many males learn of court reporting as a career option through family or friends who either are court reporters, lawyers, or judges. Recruitment through the schools needs to be improved to see that males are informed of this career option before making career choices.

## SUMMARY AND CONCLUSIONS

The project investigation can be summarized into the following two inquiries: (1) Does the sex ratio of court reporting students in NSRA-approved schools in Illinois over the past 12 years indicate an extreme relationship or shift in domination to a degree that warrants further investigation? and (2) Do the recruitment materials, curriculum descriptions, or other possible influences promote the uneven ratios or shift in ratios?

The statistical data collected from the Administrative Office of Illinois Courts in Chicago and the Illinois

Office of Registration and Education in Springfield show a decided female domination in court reporting application and certification. Applications from males for certification have dropped considerably in the last three years to as low as 3 percent of the total applications for certification in 1977. Official records were not available for the years prior to 1966, so an empirical statement of sex-ratio shift from male domination to female domination is not possible. However, it is evident that the male population of trained court reporters has diminished steadily over the last 12 years with a dramatic drop since 1975. This sex-ratio difference and recent extreme increase in female domination warranted further investigation.

A review of the recruitment materials and curriculum descriptions of the selected Illinois NSRA-approved schools was conducted by the project advisory board. The board, made up of court reporting school administrators, court reporting educators, and professional court reporters, found many instances of female sex-role stereotyping in both language and illustrations. The most blatant examples include reference to secretarial skills as a prerequisite to court reporting, court reporting as a part of a secretarial department or program, and the use of female subjects in illustrations. Sex-role stereotyping was not found to exist at a higher level in any one school nor did any particular role of advisory board member (administrator, educator, reporter) evaluate the material to any appreciable difference.

The board analyzed 11 other possible influences on the sex ratio in court reporting schools. Nine of the eleven influences were directly related to recruitment procedures completely apart from the actual recruitment materials. Some of the most emphasized were the secretarial image, recruiting in predominately female settings (shorthand classes), couching court reporting in the secretarial program, and failing to recruit in male audiences. In other words, court reporting schools are training the very people they recruit — females.

## REFERENCE NOTES

1. Peppey, R. Personal communication, February, 1978.
2. Glassbrenner, M. Personal communication, February, 1978.
3. Palmer, C. Personal communication, February, 1978.

## REFERENCES

Allen, W. C. *Correction of sex discrimination and sex stereotyping in education.* Tallahassee: Florida State University, 1976.

Beach, A. M. *A review of literature concerning behaviors which inhibit or reduce sex bias and sex-role stereotyping.* Columbus: The Ohio State University, 1977. (ERIC Document Reproduction Service No. ED 141 522)

Ellis Associates, Inc. *Approaches to expanding non-traditional opportunities for vocational education students.* Prepared under the provision of the United States Office of Education, Bureau of Occupational and Adult Education, through the Maryland State Department of Education, Division of Vocational-Technical Education, June 1977.

Feminists Northwest. *The project awareness training program.* Prepared under provision of the United States Office of Education, Department of Health, Education, and Welfare (Contract No. OEGO-00202), May 1976.

Haueisen, M. Pilot programs offered in office management and court/conference reporting. *Business Education Forum*, 1975, *29*(3), 16-17.

Karpowicz, L. J. Imagination and image. *National Shorthand Reporter*, May 1977, *33*.

Maher, S. M. *Exemplary strategies for elimination of sex bias in vocational education programs.* National Advisory Council on Vocational Education, 1976. (ERIC Document Reproduction Service No. ED 133 523)

McFate, S. Men wanted. *National Shorthand Reporter*, February 1976.

Smith, A. Stamping out sex stereotypes in North Carolina. *American Vocational Journal*, 1976, *51*(4), 30-33.

State Department of Minnesota. *Minnesota State Advisory Council for vocational education.* Minneapolis: Author, 1974.

Waga, H. A view of freelancing. *National Shorthand Reporter*, January 1978, 28-29.

WINC. *Women in new careers volume one.* Pittsburg: CONSAD Research Corporation, 1976.

Women on Words and Images (NOW Taskforce). *Dick and Jane as victims: Sex stereotyping in children's readers.* New Jersey: Princeton University, 1972.

## Synthesis

### RESEARCH PROCEDURES

Research design affects the validity, objectivity and accuracy of the answers to research questions. Situations involving human beings going about complex behaviors such as education do not readily lend themselves to rigorous controls; consequently, research design must be adjusted to accommodate the realities of the situation so that the degree of confidence in the findings is not undermined. At the present time the research effort relative to sex equity in vocational education could be strengthened by the use of more robust research designs.

This writer is willing to concede that the perception of apparent design inadequacies in studies reviewed may result from omission in reporting rather than in actual procedures used. For example, when studies do not report the number of persons involved, or give only a number of participants without indicating how their involvement was obtained or what they represent, it is difficult to accept the rest of the study with any degree of confidence. Similar omissions in areas other than sampling were observed. In the future, authors would be advised to report design aspects of their studies in sufficient detail so that others may make reasoned judgments about the findings.

#### Research Design

The research design most commonly used to examine sex equity in vocational education is the one-shot case study. The shortcomings of this design are well documented (Campbell & Stanley, 1963). As noted earlier in this review, there are those studies which use other designs. The one-group pretest/posttest was used by Griffin (1978) and Willis and Hopson (1979). Walters (1976) used a Solomon 4-group design in her study.

While the one-shot case study has limitations as a research design, it can be used to provide the kind of data base necessary to determine the status of selected variables and to explore other researchable problems, particularly in the realm of action research. Vocational educators needed baseline data and within a short time frame. As the time press becomes less severe it is hoped that research designs used will be improved and earlier studies replicated with more precision.

#### Sampling

All three of the example studies in this section used a state-base for their population. Dittman used a stratified random sample selection procedure to ensure representation from all program areas, while Moyer used a similar procedure to obtain subjects of both sexes. In both cases these researchers had the advantage of a known accessible population. In fact, Moyer had data from the entire population — a luxury not available to many researchers. Anderson and Stitt used all programs within their state to provide a sample which they justify as representative of the national population of court reporting programs.

Two studies which offer exemplary complex sampling procedures are Kane, Frazee and Dee (1976) and Atkinson (1978). Kane et al.

used a national sample and sophisticated procedures to ensure representation in both the sample of nontraditional students and control sample. The Atkinson study involved a state-based population with the need to include several strata, however, as she notes (p. 2) the nomination process may place the randomness in question.

With such exceptions as those noted above, a review of the sampling procedures used indicates non-probability samples are the norm. In most cases the sample size was adequate for complex statistical analysis, even if such procedures were not used.

### Methods of Data Collection

The most frequent methods of data collection were the use of a questionnaire or interview or some combination of the two. The Dittman and Moyer studies both involved questionnaires.

Most of the studies reviewed used instruments developed specifically for the study in question. Regrettably, little or no data are provided by most authors on the establishment of reliability and validity for these new measures. There are promising beginnings, for example Sexism Awareness Instrument (Griffin, 1978) and Attitudes Toward Women Scale (Walters, 1976). Exceptions to the use of new measures were Dittman (1976), Eversole (1977) and Griffin (1978) utilizing the Bem Sex Role Inventory (Bem, 1974, in press) and Walters' (1976) use of Rokeach Dogmatism Scale (Rokeach, 1960).

Those studies using printed materials as cases to be analyzed and/or evaluated, including the Anderson and Stitt study developed criteria and codes for this procedure. In many instances such analysis requires no evaluation on the part of the reviewer — a pronoun is either male or female or neuter. In those studies where judgment is called for, researchers would be advised to report procedures for determining interrater reliability.

## SUGGESTIONS FOR FURTHER RESEARCH

Research in the area of sex equity in vocational education is a relatively new endeavor. The findings from the effort to date plus the findings of related studies suggest further research is warranted.

One problem to be unravelled is the relation between sex affirmativeness and sex equity and whether sex affirmative effort alone meets the stated requirement of sex equity. This suggests that there is a need to examine what the result would be if programs presently offered to females alerting them to a broad variety of vocational options were offered to males simultaneously. Smith (1977) gives us a hint about the probable results, but this effort bears replication in other settings and with postsecondary populations.

An area of research needing attention is that of instrument development and validation. As noted above, there are good beginnings particularly of attitude scales and interview schedules. While these can profit from further development, they do not exhaust the possible variables or approaches. There is a need for precise observation schedule(s) to determine if there are discernable differences in behavior toward students as a result of differences in sex equity of attitudes.

We know that many vocational personnel hold views that are less than equitable with respect to males and females. To what extent are these views more or less biased than other educators or administrators or students? Assuming that attitudinal differences result in behavioral differences, effort directed toward change will need to be continued to determine an effective means of achieving sex equitable behavior. Change efforts, with appropriate research design parameters to determine the effect of a given treatment, need to be determined for both sexes — students, parents, teachers, administrators and employers.

Apparently little has been done in many program areas of vocational education to determine the extent of sex bias and sex stereotyping in educational materials. This is a need to be explored further, but perhaps a more important issue is the impact of sex fair and sex biased materials upon learners.

These suggestions are by no means exhaustive of the areas of needed research. Indeed they barely scratch the surface. They are representative samples in an area in which there is great potential and great need for further study.

## A FINAL COMMENT

Both males and females exhibit sex stereotyped or sex biased views and behaviors, and both males and females are victims of such views and behaviors. However, the majority of the researchers and personnel working in vocational education in the area of sex equity are female. Indeed the products of efforts to date — curricula, educational materials, programs designed to create awareness of the problem, etc. — by and large reflect impetus and concern by and about females. In the area of research this trend persists. The intent of noting this is to alert ourselves to the possibility of unintended consequences — self-fulfilling prophecies being one. If the goal is sex equity, both sexes need to be involved as investigators and subjects to maximize the likelihood of success and to provide data which permit realistic comparisons of the situations of males and females in vocational education. Consequently, this writer concludes, as did Parlee (1975) in a review of research in another area of study, that at the present point in time it is as important to know who are the investigators and what are the questions they have not asked as it is to know what are the findings.

## SYNTHESIS REFERENCES

Atkinson, K. *Sex-role stereotyping in vocational education: Report on the perceptions of Michigan educators.* Kalamazoo: Center for Women's Services, Western Michigan University, 1978.

Bem, S. L. The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 1974, *42*(2), 155-162.

Bem, S. L. *A manual for the Bem sex-role inventory.* Palo Alto, Calif.: Consulting Psychologists Press, in press.

Campbell, D. T., & Stanley, J. C. *Experimental and quasi-experimental designs for research.* Skokie, Ill.: Rand McNally, 1963.

Eversole, J. *Relationships between sex role attitudes of Pennsylvania vocational educators and their stated beliefs about their own sex role orientation.* Unpublished master's thesis, The Pennsylvania State University, 1977.

Griffin, W. P. *Stamp out sexism: A Texas awareness project* (Project No. 78230176). Austin: The University of Texas, 1978. (a)

Parlee, M. B. Psychology: Review essay. *Signs,* August 1975, *1*(1), 119-138.

Rokeach, M. *The open and closed mind.* New York: Basic Books, 1960.

Smith, A. J. *New pioneers: The North Carolina project to eliminate sex bias in occupational education.* Raleigh: North Carolina Department of Public Instruction, 1977.

Walters, N. *Women and career options: Final report.* Warrensburg: Central Missouri State University, 1976. (Mimeo)

Willis, C., & Hopson, C. S. *Project S.W.I.M.* New Orleans: Delgado College, 1979. (Mimeo)

# SECTION TWO

## Research on Vocational Education Curriculum and Instruction

---

CURTIS R. FINCH
Virginia Polytechnic Institute
and State University

# Research Review

## INTRODUCTION

The task of summarizing and synthesizing curriculum and instructional research is indeed ominous. Even when this task is delimited to vocational education, one can easily view the end product as reaching encylopedic proportions. The sheer magnitude of vocational curriculum and instructional efforts makes sifting processes most difficult.

This section serves to describe several trends in vocational education curriculum and instructional research. By virtue of space limitations, the discussion does not treat this research area in an exhaustive fashion. It is instead drawn from numerous studies in the field which reflect the general state of the scene. Initially, consideration is given to research efforts in the more distant past. This is followed by a summary of studies which have critically examined the quantity and quality of past vocational education curriculum and instructional research efforts. Next is provided a review of vocational curriculum and instructional research which tends to focus on topical areas and should reveal meaningful trends. Finally, several conclusions are drawn which provide an agenda for future research.

## THE PAST AS PROLOGUE

Our past is rich with documents which, in many respects, foretell the present and the future of vocational curriculum and instructional research. Perhaps the modern day "classics" in this regard are review and synthesis publications produced by the American Educational Research Association and the ERIC Clearinghouse on Vocational and Technical Education, The Ohio State University. These seminal works provide a foundational perspective and a direction for present and future research.

A particularly noteworthy review edited by Moss (1968) contains chapters focusing on curriculum development (Phipps & Evans, 1968) and techniques and modes of instruction (Householder, 1968). Phipps and Evans commented that curriculum research at that time emphasized

> (a) the identification of content common to clusters of occupations and to all kinds of work, (b) the development of curriculums for students with special needs, (c) the adaptation of curriculums to changes in educational approaches and technology, (d) the identification of curiculum changes required by technological developments, and (e) attention to occupational areas that were previously overlooked or considered unworthy.

They went on to indicate that investigators must be increasingly creative in terms of design and statistical analysis due to the complexity of curriculum development research problems. While Householder acknowledged that studies reviewed in his chapter represented an encouraging start, he stated that research efforts had "not yet made

---

Appreciation is extended by the section editor to Mr. Craig Pickering, Graduate Assistant at Virginia Polytechnic Institute and State University, for his able assistance with the literature review.

significant contributions toward the establishment of a body of knowledge on techniques and modes of instruction."

More recent review and synthesis have tended to be specific in focus and comprehensive in nature. Representative are reviews dealing with analysis for curriculum development (Larson, 1969), occupational adaptability (Sjogren, 1971), individualizing instruction (Impellitteri & Finch, 1971), and strategies for effecting change (Wall, 1972). These papers note the necessity for more systematic investigations which contribute to a meaningful body of knowlege. Impellitteri and Finch (1971), for example, cite the need for more programmatic research and development which focuses on areas that are of widespread concern. In sum, research conducted during the 1960's and early 1970's has tended to be overly simplistic and problematic in nature. Few substantive, programmatic research efforts have been carried out.

## THE PRESENT MIRRORS THE PAST

It was during the mid 1970s that several groups external to vocational education began to study what vocational education research had accomplished and the benefits that had accrued. These studies, conducted by groups such as the Rand Corporation, National Academy of Sciences, General Accounting Office, and Development Associates, sought to evaluate the payoff associated with vocational education research and development (Moore & Magisos, 1977). The Committee on Vocational Education Research and Development (COVERD) which focused most directly on research, exemplary programs, and curriculum development efforts (National Academy of Sciences, 1976), prepared a most comprehensive report which is well worth the time to review. Provided as an appendix to their report is a review of vocational education R and D in major priority areas. Comments emerging from the section on instructional techniques reflect the need for more systematic research efforts. The report noted that "there has been only limited use of experimentation, and research methodology has often been ineffective." Research in the area of curriculum development was, likewise, cited as being open to question. While COVERD noted that persons present at hearings mentioned curriculum projects more frequently than any other vocational education R and D effort as having impact on the field, research results did not support this notion. Apparently, the body of knowledge which serves as a base for vocational courses has not been fully explicated.

Perhaps of foremost concern to COVERD was the failure of vocational education R and D to deal "with significant issues and for not providing evidence of impact on students" (Moore & Magisos, 1977). While COVERD has been criticized for placing heavy reliance on the quality of secondary ex post facto data in the report development process, curriculum and instructional researchers should note that data were, for the most part, generated by persons within vocational education.

In sum, the present appears to correspond with results from the past. While research dollars have been available and studies have been completed, activities have tended to be limited in generalizability and have lacked the rigor associated with sound research methodology. Although the number of vocational education programs and students has increased dramatically, there does not appear to be an overall plan or set of plans to ensure that curriculum and instructional research ultimately contributes to the quality of vocational education.

## STRANDS OF A RESEARCH FABRIC

In spite of the criticisms leveled at vocational education curriculum and instructional research, there is certainly some light at the end of the tunnel. That which follows will serve to point up some of the more meaningful trends in curriculum and instructional research and, hopefully, provide some idea of the pattern that research is following. In order for research to have meaningful impact on the field, it is necessary to consider the range of the possible research problems and focus on homogeneous segments of this universe until each problem is eliminated or at least reduced. Consider this as the fabric of research with curriculum and instruction being fabric segments. Strands are interrelated studies which hold the fabric together and allow us to clearly identify its character. Thus, in order to be meaningful, each study should build upon a body of knowledge and seek to contribute more knowledge about an area of study.

This discussion focuses on studies having potential to be woven into a meaningful research fabric. Each study is merely illustrative of research conducted in vocational education curriculum and instruction. Others will most certainly emerge as being of equal value and utility. The ways that studies are arranged reflect trends or potential trends in the conduct of research. These arrangements include the study of curriculum content, instructional strategies, implementation, articulation, and curriculum professionals.

### Curriculum Content

While the identification of meaningful curriculum content has plagued vocational educators for many years, recent research efforts have attempted to overcome or at least seek answers to this problem. Finch and Crunkilton (1979) note that there are at least six strategies for deriving vocational curriculum content: philosophical base, introspection, function approach, task analysis, critical incident technique, and the Delphi approach. One of these, task analysis, has proven quite useful to the Vocational-Technical Education Consortium of States (V-TECS). V-TECS, which was chartered in 1973 to produce valid, up-to-date lists (catalogs) of occupational competencies, presently includes some 17 states, as well as the U.S. Army, Navy, and Air Force. It is perhaps the most massive consortium effort aimed at developing worker verified curriculum content. A similar thrust is being carried out through the Interstate Distributive Education Curriculum Consortium (IDECC). This consortium was established in the early 1970's to develop a competency-based learning system in distributive education. Consortium activities include occupational task research, competency identification and clustering, and learning activity package development.

69

Both V-TECS and IDECC have sought to meet the increased demand for competency based vocational education (CBVE) content and materials (Knaak, 1977). CBVE has emerged as a major curricular movement in vocational education and, as such, demands continued research to answer relevant questions and fill knowledge voids. Work conducted in Indiana serves to exemplify the activities carried on by several states. Reports by West (1978) and Brannock (1978) document a research sub-system which serves to strengthen the link between education and work through CBVE.

Some of the more exciting research dealing with curriculum content is being conducted at The National Center for Research in Vocational Education, The Ohio State University. The focus of this research has been occupational adaptability and transferable skills. A report by Pratzner (1978) presents many of the substantive issues which arose during project activities. Also included are several examples of transferable skills and characteristics. Other reports produced as part of the project deal with areas such as the employer's viewpoint of transferable skills (Wiant, 1977), a task classification approach for identifying transferable skills (Ashley & Ammerman, 1977), and teaching for transfer (Selz & Ashley, 1978). Collectively, these reports provide a most meaningful research base for planning and establishing vocational curricula.

Concern about non-technical curriculum content (e.g., work values and attitudes) has given rise to research in this important area. Due to the nature of non-technical content, researchers have tended to move away from the more traditional data gathering approaches in an effort to capture the elusive affective components of work. Corbin's (1976) study of goals for the Distributive Education Clubs of America points up the applicability of the Delphi technique to a content area which has no tie with an external standard (e.g., worker behavior). His results support the notion that the Delphi technique has utility for determining meaningful affective content in a range of areas. Research conducted by O'Neil and Nelson (1976) was concerned with the identification and applicability of occupational survival skills. Their investigation served as a basis for the development of meaningful curriculum materials.

A study completed by Foster (1978) served to verify the usefulness of the critical incident technique as a means of identifying non-technical affective skills. Data of the sort gathered in Foster's study would serve as a reasonably objective base for affective portions of vocational curriculum content. Beach (1979) reported the conduct of a study designed to identify affective work competencies. As part of the investigation, an *Affective Work Competencies Inventory* was developed which has provided information about the ways affective competencies vary across groups.

### Instructional Strategies

Impellitteri and Finch (1971) noted that most vocational education learning studies had been overly simplistic in design and had failed to utilize clearly defined variables. While these deficiencies generally continue to exist, several researchers have seemingly broken out of the traditional mode and conducted studies which address the complex learning processes associated with vocational education. Studies cited below serve to remind us that a range of research possibilities exist with regard to instruction and learning.

A recent study by Buffer and Miller (1978) examined the effects of selected industrial arts activities on educable mentally retarded students' achievement and retention of metric linear concepts. It is apparent that significant findings might have been lost if the researchers had not chosen to employ an experimental design with multivariate analysis of variance (MANOVA). Stewart, Lash, and Kazanas (1976) focused their research on the influence of reading ability and verbal modality and principle learning on vocational students. They, likewise, chose to randomize subjects and utilize MANOVA. Others should carefully consider following these examples as instructional research studies are being designed.

An area closely aligned with instruction is the measurement of learning. Olson (1978) reported the design and validation of a straight-copy typewriting prognostic test using kinesthetic sensitivity. A study conducted by Keith (1978) focused on the development of an instrument to evaluate problem-solving skills of secretarial students. It is only through the development of applied measures such as these that meaningful instructional outcomes may be assessed.

The demand for more relevant instruction has resulted in a greater emphasis on individualization of vocational instruction. And, while many have supported this concept, few have chosen to operationalize it to the point where individualization may be carried out in realistic learning settings. One such application is reported by Faust (1978). The New Hampshire project on alternative approaches to individualization in vocational education presents instructors with alternative implementation models, thus allowing for flexibility of installation. Other states would do well to follow this lead if their intention is to provide vocational students with individualized programs.

### Implementation

The success of any curriculum or instructional innovation is, in large part, affected by user acceptance and adoption. Thus, the diffusion of research and development products becomes equally as important as the products which are produced. Hull (1977) indicates several conditions which currently inhibit the diffusion of vocational education R and D. These include the lack of meaningful diffusion linkages and fragmented dissemination of R and D outputs. He goes on to note that the diffusion of vocational education R and D "must be based upon a sound technology, one which has been validated by research and development."

Several studies have sought to build a more valid base for the diffusion process. Russell's (1972) investigation which focused on the development of an instrument to measure change orientation of vocational education teachers has served as an instrumentation base for numerous studies in the field. Among these are studies conducted by Hood (1975) which focused on home economics teachers and Ditzenberger (1978) which dealt with perceived barriers to implementing a distributive education learning system. A related study by Oscarson (1977) examined personal characteristics as a means of identifying adoption-proneness among vocational teachers.

Research conducted by Page (1976) examined the impact of two types of innovations upon educational administrators. The innovations consisted of vocational education training materials and information documents. Results of the Page study have several implications for carrying out diffusion activities, particularly as related to printed materials and documents.

## Articulation

Over the past several years, a great deal of concern has been expressed about the articulation of vocational content between secondary and post-secondary institutions. In response to this concern, a federally funded articulation study was carried out as a joint venture of the American Vocational Association and the American Association of Community and Junior Colleges (Bushnell, 1978). This study is one of the first steps in a long-range effort which must be undertaken to devise meaningful articulation systems for vocational education. It includes case studies in articulation as well as recommendations for change to achieve effective coordination and cooperation in vocational education.

Several states have followed suit by carrying out studies focusing on their unique articulation problems and needs. In New York, levels of planning and coordinating articulated programs were identified as well as factors which encourage and factors which prevent articulation (Whalen, Bowman & Van Orman, 1979). Wisconsin developed a model for articulation which is detailed in a comprehensive implementation manual (Spanbauer & Nagy, 1977). Efforts in New Hampshire have focused on establishing a model process for curriculum articulation involving secondary and post-secondary occupational instructors (Faust, 1977).

Work being carried out in these states is representative of articulation planning going on across the nation. It appears that, in time, more systematic articulation processes will emerge. The large number of studies being conducted in this area at least ensures that a broad range of possible articulation processes will be examined and documented.

## Curriculum Professionals

The notion that persons should be prepared to deal specifically with vocational education curriculum development has sparked an interest in determining what activities these professionals should perform. One such study carried out by Wiant (1976) focused on the activities and needs of persons engaged in vocational education curriculum development in public education, business and industry, and government. For the respondent group taken as a whole, the most critical activities were found in the categories of curriculum management

72

and administration, content selection and organization, and evaluation. Somewhat similar studies were carried out by Washington State University (WSU) and American Institutes for Research (AIR) (Bakamis & McPherson, 1976). Data collection from the WSU and AIR instruments served as a basis for designing a competency-based graduate program for vocational education curriculum specialists. Modules developed as a part of these federally funded projects are currently being refined and tested on a national basis by American Institutes for Research (Jung, Helliwell & Hamilton, 1979). Hopefully, this work will provide a more definitive basis for the preparation of vocational curriculum professionals.

## REVIEW REFERENCES

Ashley, W. L., & Ammerman, H. L. *Identifying transferable skills: A task classification approach*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1977.

Bakamis, W. A., & McPherson, J. L. Vocational education curriculist competencies identified in study. *Journal of Industrial Teacher Education*, 1976, *13*, 33-40.

Beach, D. P. Necessary work values, habits, and attitudes. Presentation made at the American Educational Research Association Annual Meeting, April 1979.

Buffer, J. J., & Miller, P. W. The effects of selected industrial arts activities on educable mentally retarded students' achievement and retention of metric linear concepts. *Journal of Industrial Teacher Education*, 1978, *15*, 7-16.

Bushnell, D. S. *Cooperation in vocational education*. Washington, D.C.: American Association of Community and Junior Colleges, American Vocational Association, 1978.

Corbin, S. *Formulation of goals and objectives for the high school division of the Distributive Education Clubs of America*. Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University, 1976.

Ditzenberger, R. Perceived barriers to implementing a distributive education competency-based learning system. *The Delta Phi Epsilon Journal*, 1978, *20*, 3-16.

Faust, J. R. *A model program for the articulation of secondary and postsecondary vocational education programs in New Hampshire*. New Hampshire: Keene State College, 1977.

Faust, J. R. *Establishing curriculum components: A guide for New Hampshire vocational educators*. New Hampshire: Keene State College, 1978.

Finch, C. R., & Crunkilton, J. R. *Curriculum development in vocational and technical education*. Boston: Allyn & Bacon, 1979.

Foster, G. S. *Identification of workers' affective skills using the critical incident technique*. Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University, 1978.

Hood, F. F. Change orientation and perceptions of emerging professional roles held by teachers of home economics in Virginia (Doctoral dissertation, Texas A & M University, 1975). *Dissertation Abstracts International*, 1976, *36*, 4083A-5602A. (University Microfilms No. 76-3646, 243).

Householder, D. L. Techniques and modes of instruction. *Review of Educational Research*, 1968, *38*, 382-394.

Hull, W. L. Diffusion of vocational education R and D. *The Journal of Vocational Education Research*, 1977, *2*, 31-38.

Impellitteri, J. T., & Finch, C. R. *Review and synthesis of research on individualizing instruction in vocational and technical education*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1971. (ERIC Document Reproduction Service No. ED 058 389)

Jung, S., Helliwell, C. B., & Hamilton, J. A. *Field testing vocational education curriculum specialist materials*. Palo Alto, Calif.: American Institutes for Research, 1979.

Keith, L. S. Development of an instrument to evaluate problem-solving skills of secretarial students: A feasibility study. *The Delta Phi Epsilon Journal*, 1978, *20*, 17-24.

Knaak, W. C. *Competency-based vocational education: A review*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1977.

Larson, M. E. *Review and synthesis of research: Analysis for curriculum development in vocational education*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1969. (ERIC Document Reproduction Service No. ED 035 446)

Moore, A. B., & Magisos, J. H. Evaluation of vocational education research and development. *The Journal of Vocational Education Research*, 1977, *2*, 1-11.

Moss, J. (Ed.). *Review of Educational Research*, 1968, *38*.

National Academy of Sciences. *Assessing vocational education research and development*. Washington, D.C.: Author, 1976.

Olson, N. J. *Design and validation of a straight-copy typewriting prognostic test using kinesthetic sensitivity*. (Unpublished doctoral dissertation, University of Minnesota, 1978).

O'Neil, S. L., & Nelson, R. E. Career maintenance and mobility factors — occupational survival skills. *The Journal of Vocational Education Research*, 1976, *1*, 1-20.

Oscarson, D. J. Personal characteristics as a means for identifying adoption — proneness among vocational teachers. *The Journal of Vocational Education Research*, 1977, *2*, 25-40.

Page, D. Impact evaluation of two types of innovations upon educational administrators. *Journal of Industrial Teacher Education*, 1976, *13*, 28-33.

Phipps, L. J., & Evans, R. N. Curriculum development. *Review of Educational Research*, 1968, *38*, 367-381.

Pratzner, F. C. *Occupational adaptability and transferable skills*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1978.

Russell, E. B. *Measurement of the change orientation of vocational teachers*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1972. (ERIC Document Reproduction Service No. ED 074 211)

Selz, N., & Ashley, W. L. *Teaching for transfer: A perspective*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1978.

Sjogren, D. *Review and synthesis of research on occupational adaptability*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1971. (ERIC Document Reproduction Service No. ED 057 182)

Spanbauer, S., & Nagy, S. *Bridging the gap: A model for articulation between secondary and post-secondary vocational educators in Wisconsin*. Appleton, Wisc.: Fox Valley Technical Institute Resource Center, 1977.

Stewart, B. R., Lash, N. A., & Kazanas, H. C. Influence of reading ability and verbal modality on principle learning of vocational students. *Journal of Industrial Teacher Education*, 1976, *13*, 48-55.

Wall, J. E. *Review and synthesis of strategies for effecting change in vocational and technical education.* Columbus: The National Center for Research in Vocational Education, 1972. (ERIC Document Reproduction Service No. ED 062 512)

West, B. R. *Research for performance based vocational education in Indiana.* Bloomington: Indiana University, 1978.

West, B. R., & Brannock, D. *A plan to organize performance-based auto mechanics programs and derive learning content.* Bloomington: Indiana University, 1978.

Whalen, M., Bowman, F., & Van Orman, L. *Articulation of occupational education programs between secondary and post secondary institutions in New York State.* Albany: State University of New York, 1979.

Wiant, A. A. *Activities, problems, and needs of curriculum developers: A national survey.* Columbus: The National Center for Research in Vocational Education, The Ohio State University, May 1976.

Wiant, A. A. *Transferable skills: The employer's viewpoint.* Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1977.

# Career Maintenance and Mobility Factors — Occupational Survival Skills

SHARON LUND O'NEIL
Board of Education
New Milford, Connecticut
ROBERT E. NELSON
University of Illinois
at Urbana-Champaign

The recent advancements in American technology have created a variety of occupational complexities for the contemporary worker. As the world of work becomes more diversified, workers are faced with problems related to job maintenance, career retraining and readjustment, upgrading of skills and occupational mobility.

It is not uncommon for persons in the nation's work force to make several career changes during their working years (Bolles, 1972). In fact, Venn (1971) has indicated that four or five occupational changes may occur during one's work life. If this trend continues, most of society must be prepared to accept and adapt to occupational change.

Today, job openings exist for occupations which were not in existence a decade ago. As new jobs are created, others become obsolete (Terkel, 1974) and are no longer needed. The accelerated rate of change in our society has resulted in fewer workers being able to look forward "to a lifetime career in which the knowledge and skills which qualify them for a specific occupation in their youths will serve throughout their working life" (Adams and Reagan, 1972, p. 160).

In view of this, the ease with which workers can make the transition from one job to another becomes increasingly important. Consequently, survival in the world of work may be contingent upon possessing a common core of skills to permit career changes without pursuing extensive retraining between occupations. If these skills can be identified and infused into occupational preparation programs, problems pertaining to worker survival may be reduced or even eliminated.

The present research study was conducted to identify "occupational survival skills" — the basic knowledges, traits and competencies most appropriate for worker success in maintaining their occupations. Occupational survival skills may permit workers not only to successfully maintain their chosen occupations, but also to move from occupation to occupation with a minimum of retraining.

## METHODOLOGY

A tentative listing of over 500 occupational survival skills was identified through the following procedures: an extensive review of related literature; interviews with a variety of workers; consultations with manpower personnel, research authorities, vocational and technical research and development personnel at the state level, vocational educators and others; and input from numerous students,

---

Reprinted from *The Journal of Vocational Education Research*, 1976, *1*(2), 1-19. SHARON LUND O'NEIL is Director of Pupil Personnel and Special Services, Board of Education, New Milford, Connecticut. ROBERT E. NELSON is Associate Professor and Chairman of the Division of Business Education at the University of Illinois at Urbana-Champaign.

university faculty and staff and othe workers.

Reduction of the list of occupationa survival skill items began by combining and grouping similar descriptor The resulting list and subsequent list were submitted to more than 30 workers representing a wide diversity of occupations. Each person was asked to rate the items they considered to be important for workers to possess for successful job maintenance. The 75 most frequently checked items were then submitted to each of eight members of a selected panel of education experts. The 27 most frequently checked occupational survival skill statements remaining after eight successive ratings by the panel were included in the survey instrument. These statements appeared to be representative of the following areas: (a) interpersonal relations and communications, (b) personal characteristics, (c) decision making and problem solving, and (d) job characteristics, health and safety.

As a measure of test-retest reliability, a phi coefficient was calculated from the panel's first and second ratings of the items. The phi coefficients ranged between .41 and .63.

A telephone survey instrument was developed which contained 41 items — the 27 occupational survival skill statements to be rated by respondents as to importance in keeping their jobs, three open-ended questions concerning respondents' attitudes toward their jobs and 11 questions relating to demographic data. A pilot test was conducted to (a) refine the survey instrument, (b) estimate the percentage of response and (c) identify objectives for interviewer training sessions. Fifteen persons were trained to conduct the telephone survey.

A random sample of workers representing the general population of the State of Illinois was selected from current telephone directories. Random digit dialing was used in the Chicago area because approximately 30 percent of persons with telephones have unlisted numbers (Slattery, 1975). Within a two-week period, 589 workers were interviewed. They were grouped according to occupations into the nine occupational classifications used by the State of Illinois, Bureau of the Budget[1] (1974) — an adaptation of the system of the U.S. Government, Department of Commerce, Bureau of the Census (1960). Frequencies and standard scores were obtained, and discriminant analysis was utilized in determining differences of the variables within and among the nine occupational classifications.

## DISCUSSION OF RESULTS

A variety of information concerning the characteristics of the study population was collected. Of the 589 respondents, 295 were female and 294 were male. About 93 percent of the sample were employed at the time of the survey. Thirteen percent of the sample were self-employed. Approximately 40 percent of the respondents indicated that they worked more than 40 hours a week.

The majority of respondents (74 percent) had worked for the same organization for 2 or more years, and 44 percent of the organizations employing the sample population had a work force of 101 or more persons. Although 53 percent of the respondents had supervisory responsibilities, only 30 percent of the total sample were responsible for 6 or more persons.

Over half of the sample population were between the ages of 26 and 50; 30 percent were between the ages of 26 and 35; and 27 percent were between the ages of 36 and 50. Ninety percent of the respondents had at least a high school education. Twenty-eight percent of the sample had a Bachelor's degree or had completed 16 or more years of schooling.

---

[1] Professional, Technical, Kindred; Managers, Officials, Proprietors; Sales Workers; Clerical Workers; Craftsmen, Foremen, Kindred; Operatives; Service Workers; Laborers, except Farm; and Farmers and Farm Workers.

The 27 occupational survival skill items were rated by the 589 respondents according to *Very Important* (4), *Important* (3), *Somewhat Important* (2), *Not Important* (1), and *Does Not Apply* (0), of which the last two categories were combined and scored as (1) after obtaining frequency information. The rationale for combining these two categories was that when an item did not apply to a person's occupation, it was of no importance to that person's job. The categories were separated on the survey instrument fórm only because it was determined in the pilot test that persons were able to relate better to the two types of responses.

When the data were analyzed with the use of frequency distribution and standard scores program, it appeared that many similarities existed in the types of occupational survival skills needed by workers in the various occupational classifications. Table 1 indicates the frequencies and percentages for each of the 27 occupational survival skill items for the total of 589 respondents in the study.

In terms of frequencies over 82 percent of the 589 total respondents rated the skill to be dependable ($X_2$), as *Very Important* in keeping their jobs. The following 11 skills were rated as being *Very Important* for job maintenance by at least 50 percent of the total respondents. These skills, along with percent of response and variable number, include:

| | |
|---|---|
| 82.3% | to be dependable ($X_2$) |
| 61.6% | to understand written information ($X_6$) |
| 58.1% | to follow instructions ($X_{22}$) |
| 57.7% | to get along with people with a variety of personalities ($X_3$) |
| 57.0% | to give an honest day's work ($X_{12}$) |
| 53.3% | to manage time and materials efficiently ($X_{26}$) |
| 53.0% | to be punctual ($X_1$) |
| 52.0% | to work without close supervision ($X_{23}$) |
| 51.1% | to know what is expected of you ($X_{16}$) |
| 50.3% | to maintain good health ($X_{10}$) |
| 50.3% | to know your own abilities, strengths, and weaknesses ($X_{11}$) |

Of the 27 occupational survival skills included in the survey instrument, organizing the work activities of other people ($X_5$) was rated as the least important skill. Thirty-seven percent of the sample said this skill either was *Not Important* or *Did Not Apply* to their jobs. Thirty percent of the respondents, however, maintained it was *Very Important.*[2]

A rank ordering of means for skills in each of the nine occupational classifications is presented in Table 2. The skills are arranged in such a manner that a skill ranking higher than another skill must receive a higher mean in every occupational group than the lowest mean for another skill in any occupational group. For example, the skill of being dependable ($X_2$) has as its lowest mean for any one occupational group, 3.59 (Group 8, Laborers, except Farm). This mean is higher than the lowest mean for any other skill in any one occupational group.

Before any conclusions based on means alone are made concerning the skills needed by workers in all types of occupations, differences in occupational survival skills among the nine occupational groups should be considered. Discriminant analysis was utilized to statistically determine which of the 27 skills con-

---

[2] Note that the 27 skills on the survey instrument were selected from a preliminary list of over 500 items. Since the 27 items were selected to represent occupational survival skills that would be as broad as possible, it appears reasonable that most skills would be rated as at least *Somewhat Important* by persons in most types of occupations.

## TABLE 1

Total Responses for 27 Occupational Survival Skills

| | | Number and Percent of Total Respondents | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | VERY IMPORTANT | | IMPORTANT | | SOMEWHAT IMPORTANT | | NOT IMPORTANT | | DOES NOT APPLY | |
| Occupational Survival Skill | | No. | % | No. | % | No. | % | No. | % | No. | % |
| $X_1$ | be punctual | 312 | 57.97 | 159 | 27.00 | 65 | 11.04 | 28 | 4.75 | 25 | 4.24 |
| $X_2$ | be dependable | 485 | 82.34 | 87 | 14.77 | 10 | 1.70 | 4 | .68 | 3 | .51 |
| $X_3$ | get along with people with a variety of personalities | 340 | 57.72 | 141 | 23.94 | 67 | 11.38 | 33 | 5.60 | 8 | 1.36 |
| $X_4$ | work as a team member | 291 | 49.40 | 157 | 26.66 | 54 | 9.17 | 57 | 9.68 | 30 | 5.09 |
| $X_5$ | organize work activities of other people | 174 | 29.54 | 114 | 19.36 | 82 | 13.92 | 90 | 15.28 | 129 | 21.90 |
| $X_6$ | understand written information | 363 | 61.63 | 143 | 24.28 | 34 | 5.77 | 31 | 5.26 | 18 | 3.06 |
| $X_7$ | have basic writing skills | 220 | 37.35 | 157 | 26.66 | 92 | 15.62 | 86 | 14.60 | 34 | 5.77 |
| $X_8$ | have basic speaking skills | 252 | 42.78 | 171 | 29.03 | 83 | 14.09 | 66 | 11.21 | 17 | 2.89 |
| $X_9$ | be neat and clean in appearance | 267 | 45.33 | 154 | 26.15 | 80 | 13.58 | 65 | 11.04 | 23 | 3.90 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $X_{10}$ | maintain good health | 296 | 50.25 | 210 | 35.65 | 61 | 10.36 | 15 | 2.55 | 7 | 1.19 |
| $X_{11}$ | know your own abilities, strengths and weaknesses | 296 | 50.25 | 215 | 36.50 | 53 | 9.00 | 17 | 2.89 | 8 | 1.36 |
| $X_{12}$ | give an honest day's work | 336 | 57.04 | 198 | 33.62 | 37 | 6.28 | 13 | 2.21 | 5 | .85 |
| $X_{13}$ | be loyal to the organization for which you work | 286 | 48.56 | 168 | 28.52 | 77 | 13.07 | 34 | 5.77 | 24 | 4.08 |
| $X_{14}$ | make independent decisions | 248 | 42.10 | 199 | 33.79 | 64 | 10.87 | 55 | 9.34 | 23 | 3.90 |
| $X_{15}$ | use initiative and imagination | 248 | 42.10 | 199 | 33.79 | 65 | 11.04 | 54 | 9.17 | 23 | 3.90 |
| $X_{16}$ | know what is expected of you | 301 | 51.10 | 235 | 39.90 | 38 | 6.45 | 10 | 1.70 | 5 | .85 |
| $X_{17}$ | have basic arithmetic skills | 254 | 43.13 | 128 | 21.73 | 95 | 16.13 | 79 | 13.41 | 33 | 5.60 |
| $X_{18}$ | know how to use job materials, machines or tools | 282 | 47.88 | 138 | 23.43 | 64 | 10.87 | 56 | 9.50 | 49 | 8.32 |
| $X_{19}$ | locate information, materials or equipment | 276 | 46.86 | 187 | 31.75 | 55 | 9.34 | 39 | 6.62 | 32 | 5.43 |
| $X_{20}$ | have some type of specialized training | 244 | 41.43 | 159 | 27.00 | 70 | 11.88 | 93 | 15.79 | 23 | 3.90 |
| $X_{21}$ | have a basic knowledge of your organization's operating procedures | 239 | 40.58 | 190 | 32.26 | 76 | 12.90 | 63 | 10.69 | 21 | 3.57 |
| $X_{22}$ | follow instructions | 342 | 58.06 | 183 | 31.07 | 28 | 4.75 | 15 | 2.55 | 21 | 3.57 |
| $X_{23}$ | work without close supervision | 306 | 51.95 | 180 | 30.56 | 34 | 5.77 | 45 | 7.64 | 24 | 4.08 |
| $X_{24}$ | work under tension or pressure | 287 | 48.73 | 153 | 25.97 | 57 | 9.68 | 65 | 11.04 | 27 | 4.58 |
| $X_{25}$ | adjust to various work situations | 284 | 48.22 | 207 | 35.14 | 51 | 8.66 | 24 | 4.08 | 23 | 3.90 |
| $X_{26}$ | manage time and materials efficiently | 314 | 53.31 | 203 | 34.46 | 39 | 6.62 | 24 | 4.08 | 9 | 1.53 |
| $X_{27}$ | follow safety regulations | 285 | 48.39 | 134 | 22.75 | 63 | 10.69 | 42 | 7.13 | 65 | 11.04 |

## TABLE 2
Rank Ordering of Means for the Nine Occupational Groups

| | | Occupational Group[a] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Occupational Survival Skill | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | *Means Above 3.50 for Every Occupational Group* | | | | | | | | | |
| $X_2$ | be dependable | 3.79 | 3.72 | 3.83 | 3.84 | 3.78 | 3.76 | 3.73 | 3.59 | 3.90 |
| | *Means Above 3.00 for Every Occupational Group* | | | | | | | | | |
| $X_{12}$ | give an honest day's work | 3.33 | 3.42 | 3.54 | 3.52 | 3.46 | 3.50 | 3.29 | 3.35 | 3.80 |
| $X_{16}$ | know what is expected of you | 3.27 | 3.44 | 3.41 | 3.49 | 3.39 | 3.44 | 3.24 | 3.24 | 3.10 |
| $X_{10}$ | maintain good health | 3.13 | 3.31 | 3.33 | 3.36 | 3.24 | 3.41 | 3.65 | 3.06 | 3.60 |
| $X_{26}$ | manage time and materials efficiently | 3.31 | 3.59 | 3.33 | 3.39 | 3.32 | 3.40 | 3.10 | 3.06 | 3.70 |
| $X_1$ | be punctual | 3.00 | 3.05 | 3.07 | 3.25 | 3.55 | 3.34 | 3.42 | 3.41 | 3.40 |
| | *Means Above 2.50 for Every Occupational Group* | | | | | | | | | |
| $X_{22}$ | follow instructions | 3.05 | 2.98 | 3.52 | 3.72 | 3.53 | 3.56 | 3.38 | 3.41 | 3.30 |
| $X_{23}$ | work without close supervision | 3.37 | 3.31 | 3.13 | 3.27 | 3.30 | 3.10 | 2.92 | 3.06 | 3.20 |
| $X_4$ | work as a team member | 3.14 | 3.23 | 2.93 | 3.09 | 3.22 | 3.09 | 3.06 | 2.94 | 2.90 |
| $X_{25}$ | adjust to various work situations | 3.23 | 3.55 | 3.02 | 3.18 | 3.42 | 3.11 | 3.13 | 2.82 | 3.90 |
| $X_{11}$ | know your own abilities, strengths and weaknesses | 3.37 | 3.38 | 3.28 | 3.35 | 3.39 | 3.27 | 3.25 | 2.82 | 3.60 |
| $X_{13}$ | be loyal to the organization for which you work | 2.81 | 3.39 | 3.33 | 3.34 | 3.07 | 3.20 | 2.96 | 3.12 | 3.40 |
| $X_3$ | get along with people with a variety of personalities | 3.32 | 3.72 | 3.65 | 3.37 | 3.16 | 3.00 | 3.35 | 2.76 | 2.90 |
| $X_{19}$ | locate information, materials or equipment | 3.38 | 3.02 | 2.93 | 3.16 | 3.53 | 2.83 | 2.87 | 2.53 | 3.50 |
| $X_{14}$ | make independent decisions | 3.31 | 3.47 | 3.22 | 2.86 | 3.16 | 2.53 | 2.92 | 2.59 | 3.70 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | _Means* Above 2.00 for Every Occupational Group_ | | | | | | | | | |
| $X_{21}$ | have a basic knowledge of your organization's operating procedures | 2.85 | 3.34 | 3.30 | 3.05 | 2.93 | 2.87 | 2.73 | 2.41 | 3.50 |
| $X_6$ | understand written information | 3.62 | 3.53 | 3.33 | 3.56 | 3.58 | 2.91 | 2.98 | 2.35 | 3.70 |
| $X_{24}$ | work under tension or pressure | 3.19 | 3.34 | 2.96 | 3.22 | 2.92 | 2.74 | 3.12 | 2.35 | 3.20 |
| $X_{15}$ | use initiative and imagination | 3.34 | 3.48 | 3.30 | 2.88 | 3.14 | 2.59 | 2.83 | 2.29 | 3.50 |
| $X_{27}$ | follow safety regulations | 2.81 | 2.75 | 2.28 | 2.66 | 3.64 | 3.63 | 3.42 | 3.59 | 3.50 |
| $X_{18}$ | knowhow to use job materials, machines or tools | 2.84 | 2.52 | 2.24 | 3.07 | 3.55 | 3.47 | 2.87 | 3.41 | 3.70 |
| $X_8$ | have basic speaking skills | 3.37 | 3.31 | 3.46 | 3.16 | 2.55 | 2.21 | 2.96 | 2.24 | 3.20 |
| $X_{17}$ | have basic arithmetic skills | 2.94 | 3.02 | 3.26 | 2.92 | 3.12 | 2.67 | 2.33 | 2.18 | 3.40 |
| $X_7$ | have basic writing skills | 3.19 | 3.06 | 2.89 | 3.01 | 2.55 | 2.17 | 2.48 | 2.24 | 2.80 |
| | _Means Above 1.50 for Every Occupational Group_ | | | | | | | | | |
| $X_5$ | organize work activities of other people | 2.77 | 3.38 | 2.28 | 1.97 | 2.65 | 1.83 | 2.25 | 2.00 | 3.40 |
| $X_9$ | be neat and clean in appearance | 2.97 | 3.30 | 3.61 | 3.39 | 2.26 | 2.56 | 3.44 | 2.06 | 1.80 |
| $X_{20}$ | have some type of specialized training | 3.58 | 2.97 | 2.43 | 2.70 | 3.35 | 2.37 | 2.87 | 1.59 | 3.10 |
| | Total number of respondents | 108 | 64 | 46 | 148 | 74 | 70 | 52 | 17 | 10 |

* 1 Professional, Technical, Kindred
2 Managers, Officials, Proprietors
3 Sales Workers
4 Clerical Workers
5 Craftsmen, Foremen, Kindred
6 Operatives
7 Service Workers
8 Laborers, except Farm
9 Farmers and Farm Workers

tributed to the maximal separation of the occupational groups. Of the 8 functions (one less than the number of occupational groups), the first three functions were significant at the .001 level. The skills which maximally differentiated among the 9 occupational groups were determined by examining the standardized weights associated with the 27 variables for each of the significant functions.

### First Significant Discriminant Function

The standardized weights for the first significant discriminant function are plotted in Figure 1a. By visual examination of the weights, it was determined that the five occupational survival skills whose weights are bracketed in Figure 1a contribute the greatest to the differentiation among groups.

The linear combination for the first significant discriminant function, showing only the five highest positive and negative weights, is:

$$Y_1 = -4.95X_1 \ldots +6.49X_9 \ldots -6.87X_{18} \ldots -10.96X_{27}.$$

Occupational groups means for the first significant discriminant function are plotted in Figure 1b. For the first function, it appears that the occupational groups are basically separated into two clusters — Groups 1, 2, 3, 4, and 7; and Groups 5, 6, 8, and 9. The occupational survival skills associated with the weights of the linear combination can now be viewed with respect to the clustering of the sample centroids (means) of the occupational groups.

The five-group cluster, comprised of Professional, Technical, Kindred (Gr. 1); Managers, Officials, Proprietors (Gr. 2); Sales Workers (Gr. 3); Clerical Workers (Gr. 4); and Service Workers (Gr. 7) are mainly white collar workers. The occupational survival skills which tend to cluster these five groups together are those skills which are associated with the high positive and negative weights of the linear combination. These skills also indicate that the remaining four groups form a second cluster. In terms of the cluster of high positive-weighted skills versus the cluster of high negative-weighted skills, the occupational groups within each cluster are similar; whereas the two clusters do tend to differ from each other in respect to the 27 occupational survival skills under investigation.

With respect to the five-group cluster of occupations (white collar workers), the two skills with high positive weights (Figure 1a) can be considered extremely important to them. Consequently, occupational survival for white collar workers depends to a large extent on the skills of being neat and clean in appearance ($X_9$) and having basic speaking skills ($X_8$).

To these same five groups, occupational survival is not as dependent upon the skills of (a) following safety regulations ($X_{27}$), (b) knowing how to use job materials, machines or tools ($X_{18}$), and (c) being punctual ($X_1$). Figure 1a indicates these three skills have high negative weights.

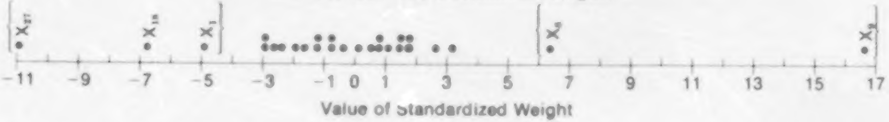
The other four groups that are clustered together on the first function are mainly persons who are blue collar workers. These groups are comprised of Craftsmen, Foremen, Kindred (Gr. 5); Operatives (Gr. 6); Laborers, except Farm (Gr. 8); and Farmers and Farm Workers (Gr. 9). These four groups, in contrast to white collar workers, consider that occupational survival depends to a large extent on (a) following safety regulations ($X_{27}$), (b) knowing how to use job materials, machines or tools ($X_{18}$) and (c) being punctual ($X_1$). Alternatively, the skills of basic speaking skills ($X_8$) and being neat and clean in appearance ($X_9$) are of lesser importance to them for occupational survival.

### Second Significant Discriminant Function

The second significant discriminant function indicates maximal separa-

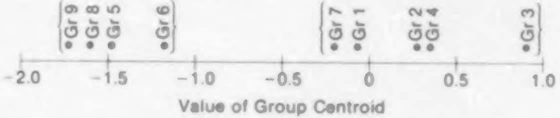
## FIGURE 1
First Significant Discriminant Function with the 27 Occupational Survival Skills ($X_i$) and the Nine Occupational Groups

**a. Standardized discriminant weights**



$X_{27}$ = follow safety regulations
$X_{18}$ = know how to use job materials, machines or tools
$X_1$ = be punctual
$X_9$ = be neat and clean in appearance
$X_6$ = have basic speaking skills

**b. Occupational group centroids**



Gr 5 = Craftsmen, Foremen, Kindred
Gr 6 = Operatives
Gr 8 = Laborers, except Farm
Gr 9 = Farmers and Farm Workers

Gr 1 = Professional, Technical, Kindred
Gr 2 = Managers, Officials, Proprietors
Gr 3 = Sales Workers
Gr 4 = Clerical Workers
Gr 7 = Service Workers

tion is again between two clusters of occupational groups (Figure 2). One cluster is made up of four groups of occupations — Professional, Technical, Kindred (Gr. 1); Managers, Officials, Proprietors (Gr. 2); Craftsmen, Foremen, Kindred (Gr. 5); and Farmers and Farm Workers (Gr. 9). These four groups include a large number of persons who are proprietors, managers, supervisors and foremen.

The linear combination for the second significant discriminant function, showing only the three highest positive and negative weights, is:

$$Y_2 = \ldots + 10.94X_5 \ldots + 12.77X_{20} \ldots - 9.20X_{22} \ldots .$$

The skills which tend to cluster these four occupational groups together including having some type of specialized training ($X_{20}$) and organizing work activities of other people ($X_5$). These two skills appear to be extremely important for managerial-type personnel to possess.

The skill which appears to be much less important to these persons for occupational survival is the ability to follow instructions ($X_{22}$). This does not seem unreasonable, since a leadership role should be appropriate for the management staff.

The other cluster of occupational groups on the second function includes five groups — Sales Workers (Gr. 3); Clerical Workers (Gr. 4); Operatives (Gr. 6); Service Workers (Gr. 7); and Laborers, except Farm (Gr. 8) — mainly subordinates. Considering these workers are primarily those persons who carry out directives of management, it is not unrealistic that a very important occupational survival skill for them is that of following directions ($X_{22}$). It follows, too, that job maintenance depends to a much lesser degree upon the skills of having some type of specialized training ($X_{20}$) and organizing work activities of other people ($X_5$).

### Third Significant Discriminant Function

On the third significant discriminant function, Groups 1, 2, 3, 4, 5, 6, and 8 are clustered together between the two outer extremes of Group 7 and Group 9 (Figure 3). Service Workers (Gr. 7) and Farmers and Farm Workers (Gr. 9) are those occupational groups among which the 27 occupational survival skills maximally differentiate. Although these two groups are separated quite markedly from a large cluster of groups lying between them, care should be exercised in interpreting the results of this function.

Farmers and Farm Workers represent only about two percent of the total sample. Two percent is compatible for representing the population from which the sample was taken; but it does not satisfy a basic rule of discriminant analysis, i.e., that the size of the smallest group should not be less than the number of variables used (Tatsuoka, 1970). Only 10 persons represent Group 9, Farmers and Farm Workers. This is an exceptionally small group considering there are 27 variables being studied in the discriminant functions. (Note that Group 8, Laborers, except Farm, with 17 persons is also a very small group.)

The linear combination for the third significant discriminant function, showing only the five highest positive and negative weights, is:

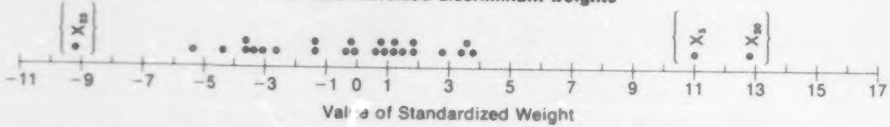
$$Y_3 = \ldots + 9.41X_9 \ldots - 8.64X_{17} \ldots + 9.23X_{20} \ldots - 7.64X_{21} \ldots + 7.68X_{27}.$$

Figure 3a indicates the standardized weights associated with the occupational survival skills of the linear combination which maximally separates Service Workers (Gr. 7) from Farmers and Farm Workers (Gr. 9) for the third significant function. Service Workers are persons who are employed in food, health, personal, protective and household services, and include such occupations as cooks, practical nurses, airline stewardesses, elevator operators, firemen, guards and policemen. The skills

## FIGURE 2

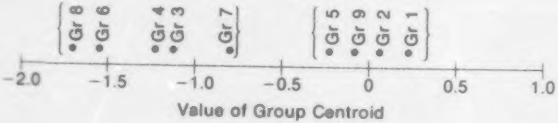
Second Significant Discriminant Function with the 27 Occupational Survival Skills ($X_i$) and the 9 Occupational Groups

**a. Standardized discriminant weights**



$X_{23}$ = follow instructions
$X_{26}$ = have some type of specialized training
$X_5$ = organize work activities of other people

**b. Occupational group centroids**

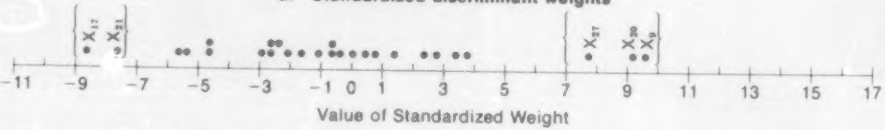


Gr 3 = Sales Workers
Gr 4 = Clerical Workers
Gr 6 = Operatives
Gr 7 = Service Workers
Gr 8 = Laborers, except Farm

Gr 1 = Professional, Technical, Kindred
Gr 2 = Managers, Officials, Proprietors
Gr 5 = Craftsmen, Foremen, Kindred
Gr 9 = Farmers and Farm Workers

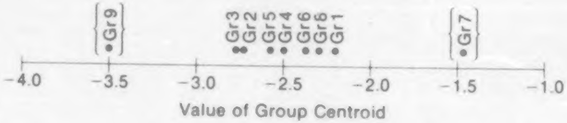
**FIGURE 3**
Third Significant Discriminant Function with the 27 Occupational Survival Skills ($X_i$) and the 9 Occupational Groups

a. Standardized discriminant weights



$X_{17}$ = have basic arithmetic skills
$X_{21}$ = have a basic knowledge of your organization's operating procedures
$X_9$ = be neat and clean in appearance
$X_{20}$ = have some type of specialized training
$X_{27}$ = follow safety regulations

b. Occupational group centroids



Gr 9 = Farmers and Farm Workers Gr 7 = Service Workers which are considered to be extremely important for occupational survival by Service Workers are (a) being neat and clean in appearance ($X_9$), (b) having some type of specialized training ($X_{20}$) and (c) following safety regulations ($X_{27}$).

A skill which is considered to be of lesser importance for occupational survival in the services area is having basic arithmetic skills ($X_{17}$). Having a basic knowledge of your organization's operating procedures ($X_{21}$) is another skill which is not considered too vital for occupational survival in a service career.

Farmers and Farm Workers (Gr. 9), on the other hand, consider that occupational survival is related to having basic arithmetic skills ($X_{17}$) and having a basic knowledge of your organization's operating procedures ($X_{21}$). The same group indicated that of the 27 skills rated, occupational survival depends the least upon the skills of (a) being neat and clean in appearance ($X_9$), (b) having some type of specialized training ($X_{20}$) and (c) following safety regulations ($X_{27}$).

Most of the persons in Group 9 (Farmers and Farm Workers) were farm owners, tenants and managers. Had the sample been larger, this may not have been true.

Approximately 39, 29 and 11 percent of the total discriminability among groups is attributable to the first, second and third discriminant functions, respectively. Consequently, approximately 80 percent of the total discriminating power of the battery as a whole is apportioned to the first three significant functions.

### Occupational Group Similarities and Differences

The group centroids for each of the three significant discriminant functions are graphed in Figure 4. Whereas Figures 1b, 2b and 3b present the first, second and third significant discriminant functions, respectively, all three significant discriminant functions can be examined in relation to each other in Figure 4.

Note that Professional, Technical, Kindred (Gr. 1) and Managers, Officials, Proprietors (Gr. 2) are clustered together for each of the three significant discriminant functions. Since the 27 variables of the present study do not differentiate between these two groups, the occupational survival skills which are necessary for workers in one occupational classification appear to be of equal importance to the workers in the other occupational group. The same would hold true concerning the occupational survival skills of lesser importance. That is, the occupational survival skills which are of lesser importance to workers in the Professional, Technical, Kindred group also appear to be of lesser importance to the workers in the group of Managers, Officials, Proprietors.

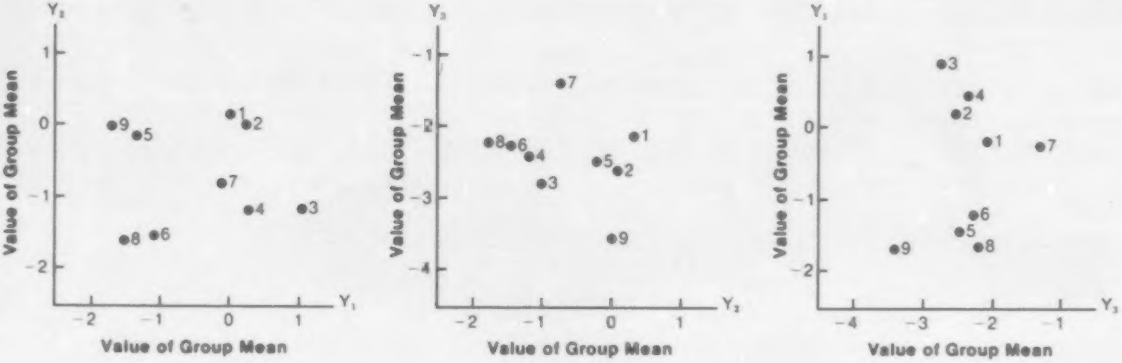
Two other occupational groups, Operatives (Gr. 6) and Laborers, except Farm (Gr. 8), also are clustered together for each of the three significant discriminant functions. Similarly, the occupational survival skills of the present study which are important to workers in the Operatives group appear to be equally important to the workers in the Laborers, except Farm group. The skills of lesser importance to one group also appear to be of lesser importance to the other group.

## SUMMARY

The present study has illustrated that there are some basic knowledges, traits and competencies that are common to all types of occupations. It appears that persons must possess many (or at least some degree of all) of these knowledges, traits and competencies for successful maintenance of an occupation.

Of the 27 occupational survival skills identified and compared in this study, 10 skills contributed to the maximal separation of two or more of the 9 occupational groups. These 10 occupational survival skills can be considered as those job knowledges, traits or competencies which

**FIGURE 4**
Group Means for the 3 Significant Discriminant Functions ($Y_1$, $Y_2$, and $Y_3$) with the 27 Occupational Survival Skills and the 9 Occupational Groups



**Occupational Groups Referred to in Diagrams**

1 = Professional, Technical, Kindred
2 = Managers, Officials, Proprietors
3 = Sales Workers
4 = Clerical Workers
5 = Craftsmen, Foremen, Kindred
6 = Operatives
7 = Service Workers
8 = Laborers, except Farm
9 = Farmers and Farm Workers

are more important for job maintenance for certain types of occupations than they are for other types of occupations:

$X_1$ to be punctual
$X_5$ to organize work activities of other people
$X_8$ to have basic speaking skills
$X_9$ to be neat and clean in appearance
$X_{17}$ to have basic arithmetic skills
$X_{18}$ to know how to use job materials, machines or tools
$X_{20}$ to have some type of specialized training
$X_{21}$ to have a basic knowledge of your organization's operating procedures
$X_{22}$ to follow instructions
$X_{27}$ to follow safety regulations

The occupational survival skills compared in the present study, however, do not appear to discriminate between the occupations which comprise the groups of Professional, Technical, Kindred (Gr. 1) and Managers, Officials, Proprietors (Gr. 2). Likewise, workers of the study population comprising the groups of Operatives (Gr. 6) and Laborers, except Farm (Gr. 8) do not differ in the types of skills (at least in terms of the 27 variables of the present study) they feel are important or are of a lesser degree of importance for occupational survival.

The other 17 occupational survival skills, however, did not appear to discriminate between or among groups. That is, when the 27 occupational survival skills were statistically tested by discriminant analysis for determining differences among the 9 occupational groups, 17 skills did not contribute appreciably to any significant differences. Consequently, the following 17 skills appear to be important for occupational survival regardless of occupational classification:

$X_2$ to be dependable
$X_3$ to get along with people with a variety of personalities
$X_4$ to work as a team member
$X_6$ to understand written information
$X_7$ to have basic writing skills
$X_{10}$ to maintain good health
$X_{11}$ to know your own abilities, strengths and weaknesses
$X_{12}$ to give an honest day's work
$X_{13}$ to be loyal to the organization for which you work
$X_{14}$ to make independent decisions
$X_{15}$ to use initiative and imagination
$X_{16}$ to know what is expected of you
$X_{19}$ to locate infomation, materials or equipment
$X_{23}$ to work without close supervision
$X_{24}$ to work under tension or pressure
$X_{25}$ to adjust to various work situations
$X_{26}$ to manage time and materials efficiently

Since occupational group similarities as well as priority differences were found in the types of skills workers need for occupational survival, both of the present study's hypotheses were supported: (1) there are occupational survival skills which appear to be important for workers in all types of occupations and (2) there are occupational survival skills which appear to be more important for workers in certain types of occupations than they are for workers in other types of occupations.

Even though similarities and priority differences were found in the types of survival skills workers consider important, none of the 27 skills were rated as being totally unimportant by any occupational group. Consequently, each of the 27 occupational survival skills rated by respondents in each of the 9 occupational groups can be considered to have some degree of importance for occupational survival.

It was not the intent of this study to deal directly with attitudes of workers toward satisfaction or dissatisfaction with their jobs, but the aspect of work satisfaction is difficult to ignore when job information is desired. In answering one of the three open-ended questions concerning work satisfaction, nearly 90 percent of the 589 respondents indicated that they keep their jobs because of salary, security or work satisfaction. Secondly, no one primary reason was given for disliking their jobs; however, interpersonal relations was the reason cited most often by workers who did find an aspect of their jobs they disliked. As a third descriptive characteristic of the sample, the majority of respondents who had held previous jobs indicated that some important personal reason was the primary factor as to why they left their last jobs (Nelson and O'Neil, in press; O'Neil, 1976).

Work satisfaction not only appears to be an important reason why people work, but why people pursue various types of jobs. Since increasing occupational mobility is becoming more evident, factors concerning job changing also may be important aspects relating to work satisfaction. Needs and desires of individuals are met through work. Knowing how to successfully survive in an occupation as a member of a mobile work force certainly gives additional meaning to preparing oneself with occupational survival skills — the knowledges, traits and competencies for successful maintenance of a job.

Based on the results of the present study, curriculum materials are being developed which will assist in preparing workers for successful job maintenance. The implications of job survival skill training may provide workers with more freedom of occupational mobility whereby they may obtain greater satisfaction and a higher sense of achievement from their jobs.

## REFERENCES

Adams, D., and Reagan, G. M. *Schooling and Social Change for Modern America*. New York: David McKay Company, Inc., 1972.

Bolles, R. N. *What Color Is Your Parachute? A Practical Manual for Job-Hunters and Career Changers*. Berkeley, CA: Ten Speed Press, 1972.

Nelson, R. E., and O'Neil, S. L. "Worker Perceptions of Occupational Survival Skills," *Journal of Industrial Teacher Education*, in press.

O'Neil, S. L. *Worker Perceptions of Skills Necessary for Survival in the World of Work* (Ph.D. Thesis). Urbana, IL: University of Illinois, 1976.

Slattery, T. R. Sales Manager, Illinois Bell Telephone Company, Champaign, IL. Personal communication, January 21, 1975.

State of Illinois, Bureau of the Budget. *Occupational Manpower Projections 1970-1980*, revised. Springfield, IL: Bureau of the Budget, State of Illinois, 1974.

Tatsuoka, M. M. *Discriminant Analysis: The Study of Group Differences*. Urbana-Champaign, IL: Institute for Personality and Ability Testing, 1970.

Terkel, S. *Working*. New York: Avon Books, The Hearst Corporation, 1974.

United States Government, Department of Commerce, Bureau of the Census. *1960 Census of Population, Alphabetical Index of Occupations and Industries*. Washington, DC: U.S. Government Printing Office, 1960.

Venn, G. "Vocational Education for All," In *Vocational Guidance and Career Development*, Herman J. Peters and James C. Hansen (Eds.). New York: The Macmillan Company, 1971.

# Influence of Reading Ability and Verbal Modality on Principle Learning of Vocational Students

BOB R. STEWART
University of Missouri
NEIL A. LASH
Broward Community College
Ft. Lauderdale, Florida
H. C. KAZANAS
University of Illinois
at Urbana-Champaign

Improvement of learning situations for individual students has received increased attention in the literature in recent years. Alternate approaches to developing materials and designing delivery systems to meet the individual needs of learners must be explored. Weisgerber (1972) pointed out that:

> While instruction and learning are customarily taken as "givens" in education, and learning has been thought of as the consequence of instruction, it is clear that instruction can take place for a group in which certain students fail to learn (p.1).

Recent emphases on individualized instruction reflect an acceptance by the educational system of responsibility to give consideration to the learning needs of each student.

Edling (1970) reported that although there is apparent agreement on the need for individualized instruction, a comparison of forty-six individualized programs indicated significant differences in the degree and kind of individualization used. Smith (1971) offered some clarification of the problem when he described five ways in which instruction can be individualized. The five ways were:

1. Rate Individualization
2. Remedial Individualization
3. Proficiency Individualization
4. Objective Individualization
5. Method Individualization

With regard to method individualization, Smith (1971) stated:

> There is a hope frequently expressed that it may be possible to identify in advance students who can learn better by one method than by another. Each student could then learn from the method which is most effective for him (p. 190).

The need for instructional resources in various formats containing comparable exposition of subject matter content is implicit in the concept of "method individualization." Providing instructional materials in alternate formats would also appear to be justified by the differences in learning style which have been demonstrated by past research.

One of the ways in which learning styles differ is learning modality. Wepman (1971) asserted that:

> Each child (and later each adult) shows a preferred pathway for acquiring information. Children who prefer the auditory pathway appear never to lose this preference but remain auditory learners all of their lives (p. 56).

This position was noted earlier by Sticht (1969) in a study of Army recruits conducted by the Human Re-

---

Reprinted from the *Journal of Industrial Teacher Education*, 1976, *13*(3), 48-55. BOB R. STEWART is Associate Professor of Agricultural Education, University of Missouri-Columbia. NEIL A. LASH is with the Broward Community College, Ft. Lauderdale, Florida. H. C. KAZANAS is Professor and Chairman, Department of Vocational and Technical Education, University of Illinois, Urbana, Illinois.

sources Research Organization. One fourth of a sample indicated that they would prefer to listen to rather than read information. For recruits classified as poor readers, the figures rose to approximately one-half. Wepman (1971) wrote:

> Fortunately, marked differences in learning via the modalities has relatively little incidence among average children. . . . The nonaverage child, however, in whom one modality is strongly dominant and others relatively weak, needs careful consideration. About 25 percent of children entering school will have one modality that is definitely superior to all others (p. 56).

This was not the case, however, for the male vocational education student population. According to Evans and Galloway (1971), the great majority of this population falls below the median of the total secondary school population on measures of academic achievement. Wepman (1971) pointed out that poor achievement is not unusual for students in the upper grades who have deficiencies in specific learning modality development.

The failure to provide for differences in learning style, particularly with regard to verbal ability, can be traced to a lack of conclusive evidence which relates media format to learning modality for the various types of instructional tasks. However, as Gagnè (1965) pointed out: "Several studies have shown that pictorial representations may be more effective than printed text for those who have reading difficulties or small vocabularies (p. 364)." It is, therefore, not surprising that pictorial representations are emphasized in individualized materials, however, they are usually accompanied by verbal information. The following question remains unanswered: Should the verbal information be available in visual format (printed) and in auditory format (recorded) so that students may select the format which they as individuals prefer?

Most instructional materials combine pictorial representations with either a visual-verbal format, or an auditory-verbal format. However, if the needs of students who have a dominant learning modality are to be met, it would seem that both verbal formats are necessary. There is little evidence regarding the manner in which verbal modality interacts with student characteristics for particular types of instructional tasks. Without such information it is difficult to justify preparation of alternate versions of instructional content.

Therefore, it was the purpose of this investigation to compare the effects of pictorial representations when accompanied by visual-verbal or auditory-verbal information on performance.

More specifically, the study attempted to answer the following questions:

1. To what extent does the performance of students vary when they receive identical content in different verbal formats accompanied by pictorial representations?
2. To what extent do reading ability and verbal format interact to affect performance?

## METHODS

In order to answer these questions, four hypotheses were developed and then tested at the .05 level of significance.

The study was conducted as a 2 x 2 randomized factorial design with replication as shown in Figure 1. The independent variables were verbal format, a method variable, and reading ability, an organismic variable. The dependent variable was performance.

Two performance objectives were identified and an instructional systems approach was used to prepare a learning unit for each objective. The first unit (Reading a Meter Scale) was almost exclusively cognitive in nature, while the second unit (Mea-

**FIGURE 1**
Design of the Study

LEARNING UNIT 1

| READING ABILITY | TREATMENT A | TREATMENT B |
|---|---|---|
| HIGH | 15 | 15 |
| LOW | 15 | 15 |

| TREATMENT A | TREATMENT B |
|---|---|
| Pictorial with auditory-verbal Formative evaluation | Pictorial with visual-verbal Formative evaluation |

LEARNING UNIT 2

| READING ABILITY | TREATMENT A | TREATMENT B |
|---|---|---|
| HIGH | 15 | 15 |
| LOW | 15 | 15 |

| TREATMENT A | TREATMENT B |
|---|---|
| Pictorial with visual-verbal Formative evaluation | Pictorial with auditory-verbal Formative evaluation |
| Summative evaluation Indicate preferred verbal format | Summative evaluation Indicate preferred verbal format |

suring DC Voltage with the Volt-ohmmeter) was considered to be primarily psychomotor in nature. In unit two, students were required to manipulate physical objects. These units consisted of a series of slides accompanied by verbal information. The verbal information for both units was prepared in two alternate formats: recorded tape (aural), and printed (visual).

High reading ability, defined as reading at or above tenth grade level, and low reading ability, defined as reading below eighth grade level were arrived at upon analysis of the readability level of the verbal information prepared for the study.

## SUBJECTS

A standardized reading test was administered to 115 tenth, eleventh and twelfth grade male students enrolled in the first year trade electricity program at the County Center, an area occupational school in Westbury, New York. Thirty high reading ability students and thirty low reading ability students were randomly assigned to each of the two treatment groups.

## PROCEDURES

The subjects in each treatment group commenced Learning Unit 1 at the same time. Each student received materials designed for individual study. A posttest was administered as each student completed this unit. After this posttest, Learning Unit 2 was initiated. A posttest covering the material in the second lesson was administered after it was completed. All students then received a summative evaluation covering the materials in both learning units. The final item in the summative evaluation requested that students indicate the verbal format they would prefer for a subsequent learning unit. Both posttests and the summative evaluation were rated and scored in accordance with procedures that had been agreed to and practiced prior to the experiment.

## RESULTS

The two verbal formats treated in this study were aural (recorded tape) and visual (printed page). The two reading ability levels were identified as high and low. Principle learning was measured by a performance posttest administered upon completion of each learning unit. Four hypotheses were stated in the null form for purposes of testing.

The first hypothesis was:

$Ho_1$: No significant difference exists between the performance on formative evaluation of students who were experiencing the two verbal formats in Learning Unit 1.

A two-way analysis of variance of performance scores on Learning Unit 1 was conducted. The results of this analysis, reported in Table 1, indicated a significant difference between the levels of performance for the two verbal formats treated in this study. Students who experienced the visual format (printed page) performed significantly different than those who experienced the aural format (recorded tape). Therefore, $Ho_1$ was rejected.

The second hypothesis was:

$Ho_2$: No significant difference exists between the performance on formative evaluation of students who were experiencing two verbal formats in Learning Unit 2.

The performance scores of Learning Unit 2 were subjected to a two-way analysis of variance, the results of which appear in Table 2. This analysis did not reveal any significant difference in performance between students who experienced different verbal formats. Therefore, $Ho_2$ was not rejected.

The third hypothesis was:

$Ho_3$: No significant difference exists between the performance on formative evaluation on high and low ability readers.

This hypothesis was rejected for both Learning Unit 1 and 2 on the basis of the analysis of variance in performance scores for each learning unit as reported in Tables 1 and 2.

**TABLE 1**

Analysis of Variance in Performance
on Formative Evaluation
for Learning Unit 1

| Source | Sum of Squares | df | Mean Square | F |
|---|---|---|---|---|
| Verbal Format | 39 | 1 | 39 | 4.56* |
| Reading Ability | 202 | 1 | 202 | 23.63* |
| Interaction | 20 | 1 | 20 | 2.34 |
| Within Groups | 479 | 56 | 8.55 | |
| TOTAL | 740 | 59 | | |

* Significant at .05 level.

The fourth hypothesis was:

$Ho_4$: No significant interaction exists between verbal format and level of reading ability with regard to performance on formative evaluation.

Interaction between verbal format and level of reading ability was not supported by the data of either learning unit as reported in Tables 1 and 2. Therefore, $Ho_4$ was not rejected.

The significant findings regarding verbal format, reading ability and interaction have been tabulated for both learning units and are presented in Table 3.

**TABLE 2**

Analysis of Variance in Performance
on Formative Evaluation
for Learning Unit 2

| Source | Sum of Squares | df | Mean Square | F |
|---|---|---|---|---|
| Verbal Format | 37 | 1 | 37 | 3.56 |
| Reading Ability | 84 | 1 | 84 | 8.09* |
| Interaction | 1 | 1 | 1 | 0 |
| Within Groups | 581 | 56 | 10.38 | |
| TOTAL | 702 | 59 | | |

* Significant at .05 level.

**TABLE 3**

Significant Findings for Learning
Units 1 and 2

| Source | Performance | |
|---|---|---|
| | Unit 1 | Unit 2 |
| Verbal Format | SIG | NS |
| Reading Ability | SIG | SIG |
| *Interaction* | NS | NS |

SIG = Significant at .05 level
NS = Not significant

## DISCUSSION

The findings of the study indicated that high reading ability students performed significantly higher than low reading ability students on the posttest that followed each learning unit.

However, there was a lack of consistency in findings of performance as it related to the different verbal formats. Students in group B who experienced the visual-verbal format in Learning Unit 1 were found to have a significantly higher score than treatment group A students who experienced the aural-verbal format. In Learning Unit 2, students in treatment group B did not perform significantly different when the verbal formats were reversed. At this point one would suspect that the difference in performance levels was due to differences in the composition of the treatment groups. However, this conclusion was not substantiated by the data used to establish the equality of the two treatment groups. It is the investigators' opinion that the differences in performance can be attributed to differences in the match between instructional objectives and verbal format for the two learning units. Although principle learning was the objective of both learning units, in the first (Reading a Meter Scale) it was almost exclusively cognitive, while in the second (Measuring DC Voltage with the Volt-ohmmeter) it was primarily psychomotor, and students were required to manipulate physical objects. It is suggested that the inherent ability to go back and review the verbal information in the printed format was more facilitating to the cognitive task, while the lack of physical distraction afforded by the recorded format facilitated performance on the psychomotor task of Learning Unit 2. It is, therefore, suggested that both level of learning and domain of knowledge should be considered when judging the equality of two instructional objectives.

## REFERENCES

Edling, Jack V., *Individualized instruction: A manual for administrators*, Corvallis, Oregon: D.C.E. Publications, 1970.

Evans, Rupert N., and Joel D. Galloway, "Verbal ability and socioeconomic status of ninth and twelfth grade college preparatory, general, and vocational students," paper presented at the 65th Annual Convention of the American Vocational Association, Portland, Oregon, December 7, 1971.

Gagnè, Robert M., *The conditions of learning*, New York: Holt, Rinehart and Winston, Inc., 1965.

Smith, Robert G., Jr., *The engineering of educational and training systems*, Lexington, Mass.: D.C. Heath and Company, 1971.

Sticht, Thomas G., *Learning by listening in relation to aptitude reading and rate-controlled speech*, Alexandria, Virginia: Human Resources Research Organization, Technical Report 69-23, 1969.

Weisgerber, Robert A., *Trends, issues and activities in individualized learning*, Stanford, California: ERIC Clearinghouse on Media and Technology, 1972.

Wepman, Joseph M., "Modalities and learning," *Coordinating Reading Instruction*, H. M. Robinson (ed.) Glenview, Illinois: Scott Foresman and Company, 1971.

# Cognitive Interaction and Learning

DOROTHY KIZER
Prairie View A. and M.
University
M. MARGUERITE SCRUGGS
Oklahoma State University

Competency-based education in home economics currently assumes the validity of many of the competencies required of prospective home economics teachers. The present study dealt with one problem that must be solved before the predictive validity of competencies can be established, namely, the relationship between what a teacher does in the classroom and student learning.

Although many studies have dealt with the affective domain of student learning (Gage, 1972, p. 127), the relationship between classroom behavior of teachers and students and cognitive learning has been relatively neglected in research. Teachers use 20 to 30 percent of classroom time in teacher-student discussion (Nuthall and Snook, 1973, p. 52), but little is known about the relationship between various cognitive levels of classroom discussion and student achievement (Rosenshine and Furst, 1971).

Neither the current state of knowledge of teaching (Nuthall and Snook, 1973, p. 49) nor the extent to which intervening variables could be controlled in the present research permitted a definitive study. Rather, the findings are presented here to stimulate hypothesis development and facilitate improved research design for further studies of teaching.

## OBJECTIVES

The principal objective of the study was to determine the relationship between levels of cognitive interaction in the classroom and student learning. Secondary objectives were (1) to describe cognitive interaction in the home economics classes and (2) to examine educational ability, length of unit, and learning climate as intervening variables between cognitive interaction and student learning.

## CONCEPTUAL MODEL

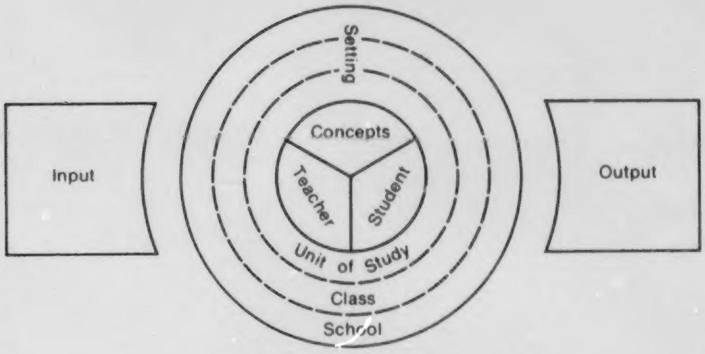
The conceptual model for this research was derived from the evaluation model of Smith (1971). As shown in Figure 1, the model contains the following components: input; setting, including school, class, and unit of study; a triad of relationships among teacher, students, and concepts; and output. The model reflects elements of two types of models described by Nuthall and Snook (1973, p. 49) as "discovery-learning" and "rational." Although useful for this research, the depicted system of relationships needs much more development and testing before it can meet the criteria for judging theories of teaching summarized by Snow (1973, pp. 103-106).

The input component includes what students bring to a learning situation (Gagne, 1970, pp. 66-67). In this study, input was represented by the general educational abilities of students as

---

Reprinted from the *Home Economics Research Journal*, 1978, 7(1), 44-51. DOROTHY KIZER is with the College of Home Economics, Prairie View A. and M. University, Prairie View, Texas. M. MARGUERITE SCRUGGS is with the Division of Home Economics, Oklahoma State University, Stillwater, Oklahoma. This research was done at Iowa State University.

**FIGURE 1**
Conceptual Model



measured by the Iowa Tests of Educational Development (University of Iowa, 1970).

The setting component, or learning situation, is composed of the school, class, and unit of study. School was associated with teacher in the present study, with each teacher being from a different school. Class was represented by one home economics class from each school as well as a comparable group of students not enrolled in the class. All students were juniors or seniors in high school. The aspect of class examined was the learning climate as measured by the Student Estimate of Teacher Concern (Zimmerman, 1971) and the Learning Environment Inventory (Anderson, 1971). Unit of study was limited to the child development area. A core of instructional objectives was assumed to be common to all of the home economics classes, as suggested in Iowa curricular material (Iowa Department of Public Instruction, 1968) and as documented in the teacher's stated objectives.

The dynamic component of the conceptual model in Figure 1 is the central triad which represents the actual teaching process involving interactions among the teacher, students, and concepts. Hyman (1967, p. 68) stated that a dynamic quality "is implied in the triadic conception of teaching because as the relationship between teacher and pupil changes, . . . the teacher must continually change his relationship with" the concept. In this study, the interactions dealt with concepts of child development and were described in terms of levels of cognitive behavior as categorized by a system developed by Brun (1971), the Brun Cognitive Interaction System (BCIS).

The final component of the model, output, is the learning attained by the students. Learning was assessed in this study by means of the Children and Childhood test, an adaptation of a test by Clover (1973).

## SAMPLE

The population of teachers consisted of the 29 home economics education majors who graduated from Iowa State University in 1971 and who were teaching in Iowa during the second semester of the 1971-72 school year. The sample of teachers was composed of all who were teaching a child development unit in an eleventh or twelfth grade home economics class between March 1 and the end of the school year. All 17 teachers who met this requirement were willing to participate; however, only 13 actually took part because of scheduling conflicts in four schools.

The second stage of the sampling involved selection of student groups. The 345 eleventh- and twelfth-grade students participating in the study consisted of two groups from each of the 13 high schools. The *class group* was composed of students in the specified home economics class. The control group consisted of students similar in educational background, and of the same grade levels and sex as class members, but who were not enrolled in the home economics class and had not studied child development the year of the study.

Several controls were built into the sample selection. All the teachers were graduated from the same undergraduate program, had comparable preparation in child development and cognitive interaction. Teacher behaviors were predominantly at the "apply" level (Category 2), with one-fourth of the teachers exhibiting no behavior higher than that level.

Median cognitive levels were calculated for teacher and student behaviors for each session (Category 0 was omitted). In session I, teacher medians ranged from 1.38 to 2.02; student medians, from 1.23 to 1.90 (1 = recall, 2 = apply). The ranges in medians were similar for session II, 1.41 to 2.03 for teacher behavior and 1.32 to 1.96 for student behavior. Thus, median cognitive levels of behavior were similar for teachers, students, and sessions.

Students responded at the cognitive level elicited by the teacher over 80 percent of the time in terms of all pairs of teacher-student behaviors in the total study. Within any one class, the pairs of teacher-student behaviors in which both behaviors were at the same level ranged from 60.2 to 96.6 percent for session I and from 63.4 to 94.3 percent for session II. For most classes, the percentages were similar for the two sessions.

More of the teacher-student pairs of behaviors with unequal cognitive levels showed higher behaviors for the teacher than for the student. This finding appears consistent with the idea that teachers stimulate students to deal with information on progressively higher cognitive levels.

Flanders (1970, p. 425) suggested the usefulness of investigating variation patterns of teaching behavior. In the present study, variation patterns were quantified by calculating the percentage of each teacher's behaviors which differed in cognitive level from her preceding behavior. The variation in a class session ranged from 4.6 to 40.7 percent. In general, the teachers varied less in the second session than in the first, although differences between sessions were smaller than differences among teachers. Only three teachers varied between sessions as much as 10 percent.

## DESCRIPTION OF STUDENT LEARNING

Learning of students was assessed by an achievement test designed to measure the five levels of cognitive behavior represented by the five behavioral levels of the BCIS. A test developed by Clover (1973) to measure basic child development concepts in home economics III classes was adapted. A panel of judges in child development and home economics education validated the cognition level assessed by each item and the accuracy of content. The final form of the test consisted of 42 items with a possible score of 55.

The teachers administered the test to members of their classes and control groups. The total test score for each student was used to obtain mean scores for each class and each control group.

The reliability of this measure of student learning was estimated by using the split-half procedure. Internal consistency of the test performance of the groups of students (classes and control groups) was estimated on the basis of the total test scores for the two halves of each group. This was appropriate because group scores rather than individual scores were to be used as a measure of learning in a class. The scores of individuals in a class are not independent; each replicates a measure of learning in the class. The process involved randomly assigning members of each class (or control group) to two groups, using mean test scores from each half-class in the correlation procedure, and correcting for attenuation. The estimate of reliability thus obtained was .48 for the class groups and .69 for the control groups.

These estimates reflected a portion of the difficulty in assessing higher cognitive processes, particularly of the fifth level of achievement, *create*. The lower estimate of reliability for the scores of the class groups was due partially to the small number in the study and to the wide range of general educational ability within some small classes. In one class, percentile ranks on the Iowa Tests of Educational Development (ITED) ranged from 1 to 99. By chance the two halves of the class had mean ITED percentile ranks of 17 and 67. Results for this and two other similar classes contributed substantially to the low reliability coefficent.

To determine if the achievement test differentiated among the classes and control groups, a one-way analysis of variance was performed. Using the mean test scores of the 26 class and control groups, an $F$ value of 2.59 ($p < 0.01$) was obtained. The achievement test did differentiate among the groups.

Student scores on the Children and Childhood test yielded a range of class mean scores from 23.50 to 32.33 and control group mean scores from 20.93 to 29.28. Assuming that class and control groups were comparable in ability, the difference between the mean scores for the class and control group in each school was assumed to reflect learning attributable to the class, and also served as a control for school differences that could have affected test performances.

## DESCRIPTION OF INTERVENING VARIABLES

Since the primary purpose of the study was to examine the relationship between cognitive interaction and learning within the natural setting of classrooms, a number of intervening variables needed to be accounted for in the analysis. These variables are the components of *input* and *setting* in the conceptual model.

The student Iowa Tests of Educational Development (ITED) percentile ranks and information on length of units of study were supplied by the teachers. Data on classroom learning climate were obtained from the Learning Environment Inventory (LEI) and the Student Estimate of Teacher Concern (SETC) administered to class and control groups students by teachers. Students placed their responses in an envelope which was sealed before they left class to reassure them that the teacher would not see the responses. This procedure, reported by Zimmerman (1971, p. 82), was used to "insure that students would respond freely to the instrument."

The mean ITED percentile ranks for class groups ranged from 35.69 to 53.69; for control groups, from 38.71 to 67.78. Although the class groups and their respective control groups were similar in educational background, the class groups were significantly lower in educational ability measured by the ITED. Results of a $t$-test of difference of means of ITED percentile ranks of classes and control groups yielded a value of 4.01 ($p < 0.01$).

Four scales of the LEI, Environment, Goal Direction, Satisfaction, and Apathy, were used separately. Each of these scales had a possible score of 28. According to the student responses, class means ranged from 13.29 to 22.38 on Environment, 13.90 to 23.25 on Goal Direction, 11.80 to 21.24 on Satisfaction, and 12.00 to 21.30 on Apathy.

100

The other measure of learning climate was obtained from a cluster of 39 items selected from the SETC by Zimmerman (1971). Student responses yielded mean class scores ranging from 11.70 to 35.57 out of a possible score of 39.

## RELATIONSHIP AMONG COGNITIVE INTERACTION, STUDENT LEARNING, AND INTERVENING VARIABLES

Computer-generated scatterplots were visually inspected to determine relationships between pairs of variables. The variables examined were levels of cognitive interaction, educational ability, length of unit, and learning climate.

When no other variables were considered, the median levels of cognitive behaviors of teachers and students were not related to student learning as measured by mean test scores for classes. Figure 2 is a representative scatterplot illustrating this finding. The extent to which pairs of teacher-student behaviors were of the same or different cognitive levels was also examined, but appeared not to be associated with learning either.

With the exception of Schools D and H in Figure 3, a linear relationship is depicted between variation patterns in cognitive behavior of students and student learning. Educational ability of students was a possible reason for the location of Schools D and H on the scatterplot. The class members in School D not only had the highest mean ITED percentile (53.69) of all classes, but their educational ability appeared to be representative of the school. The ITED mean for the control group exceeded levels of learning. This exploratory study was undertaken to furnish clues which might aid in understanding this phenomenon.

**FIGURE 2**

Relation between Class Mean Test Scores and Median Levels of Teachers' Cognitive Behavior for Session II (letters represent schools; number subscripts indicate length of unit in weeks)

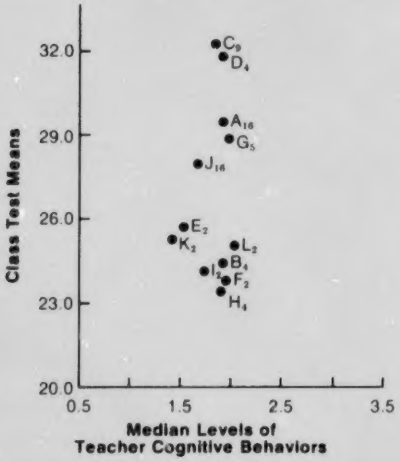


**FIGURE 3**

Relation between Variation Pattern of Sequent Behaviors of Teachers for Session II and Class Test Mean Scores (axes are reversed to depict range more clearly in variation patterns)

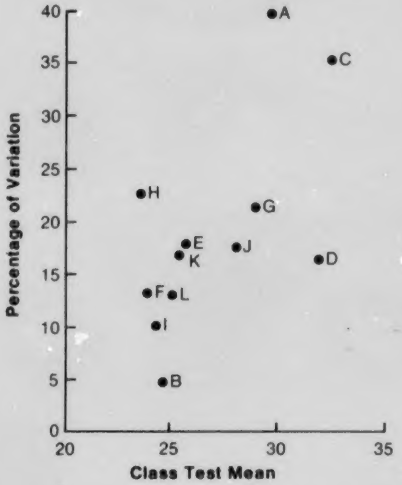


**FIGURE 4**
Differences between Class and Control Group Mean Test Scores as Related to Differences on ITED (letters represent schools; subscripts indicate lengths of units in weeks)

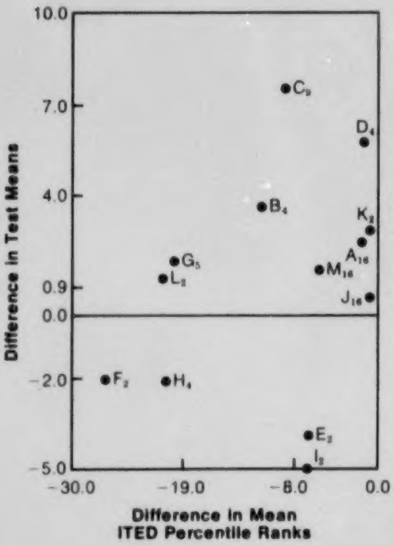
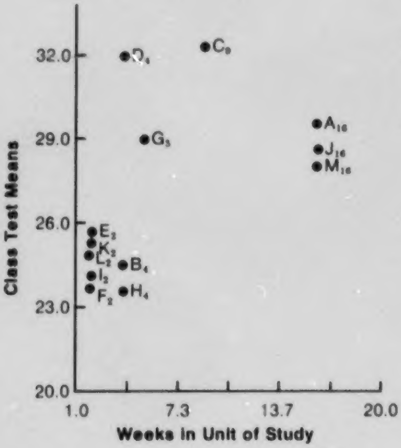


**FIGURE 5**
Relation of Class Mean Test Scores to Weeks in Unit of Study (letters represent schools; subscripts indicate number of weeks in unit)



The sample included 13 first-year home economics teachers who were graduates of the same undergraduate program, their eleventh and twelfth grade homemaking classes, and control groups of students from each school. Videotaped classroom discussions of teachers and students were analyzed according to the BCIS in terms of levels of cognitive behaviors exhibited. Various measures of cognitive interaction included frequency of behaviors at each level, median levels of cognitive behaviors in which the level of the pair of behaviors was the same or different, and variation patterns of sequent behaviors.

Student learning was assessed by means of an achievement test administered to the classes at the end of a child development unit and to control groups who had not participated in the unit. The test included all five levels of cognitive behavior.

Educational ability of the students, length of the unit, and learning climate were considered as variables affecting student learning.

When considered alone, median levels of cognitive behaviors of teachers and students were not related to student learning. However, analyses incorporating results for all students in regard to educational ability and performance on the achievement test supported the hypothesis of a relationship between student learning and certain variation of median levels of cognitive behavior over time. Varied patterns of teacher behaviors appeared to be related to student learning.

Results of this exploratory study were sufficiently encouraging to suggest that additional research be conducted to refine and develop measures of cognitive interaction within the classroom as a means of testing relationships between levels of cognitive behavior and cognitive learning of students. It is recommended that all variables identified as *input* or as *setting* be incorporated in future studies. Increased control of comparability of class and control groups, and of such variables as length of unit and educational objectives, should increasingly clarify results.

## REFERENCES

Anderson, G. J. *The Assessment of Learning Environments: A Manual for the Learning Environment Inventory and the My Class Inventory*. Halifax, Nova Scotia, Canada: Atlantic Institute of Education, 1971.

Brun, J. K. K. *An Observational Method for Studying Classroom Cognitive Processes*. (Doctoral dissertation, Iowa State University) Ann Arbor, Mich.: University Microfilms, 1971, No. 71-7250.

Clover, K. H. Assessment of observation and participation activities of high school pupils in child development class. Unpublished master's thesis, Iowa State University, 1973.

Flanders, N. A. *Analyzing Teacher Behavior*. Reading, Mass.: Addison-Wesley, 1970.

Gage, N. L. *Teacher Effectiveness and Teacher Education*. Palo Alto, Calif.: Pacific Books, 1972.

Gagne, R. M. *The Conditions of Learning*. (2nd ed.) New York: Holt, Rinehart and Winston, 1970.

Hyman, R. T. Teaching: Triadic and dynamic. *Educational Forum*, 1967, *32*, 65-69.

Iowa Department of Public Instruction. A Guide for Developing a Curriculum in Human Development and the Family. Des Moines, Ia.: Author, 1968.

Nuthall, G., and Snook, I. Contemporary models of teaching. In R. M. W. Travers (Ed.), *Second Handbook of Research on Teaching*. Chicago: Rand McNally, 1973.

Rosenshine, B., and Furst, N. F. Research in teacher performance criteria. In B. O. Smith (Ed.), *Research in Teacher Education*. Englewood Cliffs, N.J.: Prentice-Hall, 1971.

Smith, T. C., Jr. *The Utility of an Evaluative Model in Judging the Relationship between Classroom Verbal Behavior and Student Achievement in Three Selected Physics Curricula, a Final Report*. Houston, Texas: Houston University, 1971. (ERIC Document Reproduction Service No. Ed. 056 889).

Snow, R. E. Theory construction for research on teaching. In R. M. W. Travers (Ed.), *Second Handbook of Research on Teaching*. Chicago: Rand McNally, 1973.

University of Iowa. *Manual for the School Administrator, Iowa Tests of Educational Development*. Iowa City, Ia.: Author, 1970.

Zimmerman, K. W. *Verbal Classroom Interaction and Characteristics Including Self-actualization of Home Economics Teachers*. (Doctoral dissertation, Iowa State University) Ann Arbor, Mich.: University Microfilms, 1971, No. 71-14280.

Received November 26, 1976; accepted September 1, 1977.

# Personal Characteristics as a Means for Identifying Adoption-Proneness among Vocational Teachers

DAVID J. OSCARSON
Pittsburg State University

The notion of educational change has often been a focal point of educational researchers and those responsible for the diffusion of educational innovations. In many cases much frustration has resulted due to the great degree of lag between the diagnosis of a need for change and the actual introduction and adoption of methods necessary for meeting the need. Despite the great degree of reluctance toward change in our educational institutions, earlier studies by Mort and Cornell (1941) indicated that school systems exist in which there are teachers who are highly trained and accepting of modern educational practices.

Recently, there has been a more intense preoccupation with justifying educational change and innovation, especially since the advent of demand for accountability by the taxpayer. Gross and others (1971) have attributed the preoccupation with educational change to a number of factors: criticisms of progressive education that arose after World War II, the efforts of schools to meet the demands of a rapidly changing society, threats to our national defense, the knowledge explosion, new theoretical insights into the learning process, and more recently, the civil rights movement, the pressures of community action groups, and expanded federal aid to education.

Lippitt and Havelock (1968) have shown that it is important for those initiating educational change to work closely with the potential adopters or client system. They list four conditions necessary for the successful implementation of change or innovation: (1) preparatory development of the new competence before trying, (2) the demonstrated desirability of trying, (3) support at the critical risk period, and (4) adequate feedback to support continuity of the effort. Additionally, it is important to assist the potential adopter in defining what criteria will be used to measure progress and success.

Even though we have witnessed an emergence of research concerning educational change and innovation, major deficiencies still exist. Often, results of on-going research conducted at colleges and universities is not disseminated to those involved with the change process (Rogers, 1965). Additionally, few studies have focused on the teacher as the adoption unit, despite her or his importance in the decision making process.

Fullam (1972), in a review of existing literature on the innovation and change process in schools concluded that most innovations were developed externally and then transmitted to schools. In most cases, it is assumed by the change agent that the innovation will be accepted by the adoption unit. Therefore, many educational changes and innovations are doomed to failure due to a lack of concern and understanding of the adoption unit (teacher). When there is acceptance of an innovation by a teacher, rarely is the degree of utilization known.

The following pages describe a study in which the personal char-

---

Reprinted from *The Journal of Vocational Education Research*, 1977, *2*(3), 25-40. DAVID J. OSCARSON is Coordinator of Graduate Technology, Department of Technology, Pittsburg State University, Pittsburg, Kansas.

acteristics of secondary vocational teachers were examined in order to explain, at least in part, an individual's proneness or lack of proneness toward the adoption of educational innovations.

## CONCEPTUAL FRAMEWORK

Rogers and Shoemaker (1971, p. 103) have conceptualized the innovation-decision process for individuals as a paradigm with a set of four functions or stages through which an individual proceeds before he or she adopts an idea, concept or object. Briefly, the four stages are as follows:

*Knowledge* — The individual is exposed to the innovation's existence and gains some understanding on how it functions.

*Persuasion* — The individual forms a favorable or unfavorable attitude toward the innovation.

*Decision* — The individual engages in activities which lead to a choice to adopt or reject the innovation.

*Confirmation* — The individual seeks reinforcement for the innovation decision he has made, but he may reverse his previous decision if exposed to conflicting messages about the innovation.

In addition to the above stages, the authors point out that certain antecedent conditions may exist before an individual proceeds through the four stages. Antecedents include: (1) the individual's personality characteristics, e.g., her or his attitude toward change; (2) an individual's social characteristics, e.g., cosmopolitanism; and (3) the strength of perceived need for the innovation.

The objectives of this study dealt directly with testing the antecedent conditions of the innovation-decision process paradigm as conceptualized by Rogers and Shoemaker. In doing so, the study sought to determine if various predictor variables (the personal characteristics of vocational teachers) explain a criterion variable, proneness towards the adoption of education innovations. An additional aspect of the study concerned the combination of variables, which, when acting in concert, tended to best predict adoption-proneness.

## PROCEDURES

### Sample

The sample for this study consisted of 310 vocational teachers from four school districts within the state of Virginia. This sample included all vocational teachers serving within the four districts. In addition, these teachers represented all vocational subject areas taught in the districts (Agriculture, Business and Office, Distributive Education, Health Occupations, Home Economics, Trade and Industrial Education, and Industrial Arts).

Three of the districts consist of small towns interspersed with light industry and farming operations and have a combined population of 103 vocational teachers. The three districts adjoin and come under the supervision of one local vocational director. As a result of the above characteristics, the districts were considered a homogeneous subset of the total sample selected for this study.

The fourth district consisted of 207 vocational teachers from a large public school system. In contrast to the other three districts, this district is one of the largest metropolitan school systems in Virginia.

The four districts for this study were selected on the basis that vocational teachers serving these districts were considered representative of all vocational teachers within the state of Virginia. The northeastern and eastern portions of Virginia are primarily metropolitan, while the remaining portions of the state can be considered semi-rural, with small and medium sized cities scattered throughout. Thus, the selection of the four districts provided a cross section of the above population densities. In addition, the districts considered were not under the direct influence of the testing and experimentation by colleges and universities within the state.

### Variables

The variable selection process for this study was dictated by the conceptual framework and theoretical constructs of the study as well as a review of the literature centering on adoption-prone individuals. In one study, Tardanico (1974), examined the change receptivity of writers and non-writers of occupational education proposals. He found significant differences between groups when considering demographic characteristics. His findings indicated that: sex, years in the same school, years in teaching, degree level, professional publications read, membership in professional organizations, income, and membership in non-professional organizations were significant in distinguishing change receptivity between the two groups. Hood (1975), found positive relationships existed between professional commitment and: years in teaching, years in the same school, age, and magazines and journals used for new teaching ideas.

Research studies, such as the above, were influential in the selection of variables for this study. The disciplines of rural sociology, extension services, marketing research, and various areas of educational research also contributed to the selection of variables.

The independent variables chosen were as follows: (1) age, (2) number of years in teaching, (3) level of educational achievement, (4) recency of professional education, (5) number of professional publications read monthly, (6) membership in professional organizations, (7) number of school districts in which the vocational teacher has taught, (8) number of years teaching in the present school district, (9) intolerance for the ideas of others (dogmatism), (10) predisposition toward changing teaching methods, (11) personal satisfaction with teaching, (12) the teacher's assessment of the actual influence exerted by four sources (school board, superintendent, vocational teachers, and academic teachers) on instructional procedures, and (13) the teacher's assessment of the ideal influence that should be exerted by the four sources on instructional procedures.

### Instruments

*Biographical form.* Information concerning the teacher's age, number of years in teaching, level of educational achievement, recency of professional education, number of professional publications read monthly, membership in professional organizations, number of school districts in which the vocational teacher has taught, and the number of years teaching in the present school district was obtained by utilizing a biographical data form. Content validity for this instrument was established from the literature search based on what other studies have shown to be valid predictor variables.

*The Dogmatism Scale.* A short version of the *Dogmatism Scale*, developed by Troldahl and Powell (1965) from the earlier work of Rokeach (1960) was selected and used to measure individual tolerance for the ideas of others, or openness or closedness, and its relationship to adoption-proneness. By means of the Spearman-Brown prophecy formula, these authors established the "lower-limit" reliability of the 20-item version as being .78. Also, cross validation has produced a correlation of .94 between this version and the 40-item version reported by Rokeach (1960).

*A scale to measure openness to change.* It was posited that if a teacher exhibited an openness to change, he or she would also demonstrate proneness toward the adoption of new ideas and concepts in teaching. To determine mean openness to change, a scale developed by Dohmann (1970) was used in this study. Basically, this scale of 10 items attempts to measure teachers' general perceptions relating to successful change. It appears there are certain qualities in these perceptions, i.e., teachers rely too heavily on the use of textbooks, which characterize proneness to change, while other qualities do not facilitate an "open" point of view. Using the Kuder-Richardson 21 formula, Dohmann (1970) found a reliability of .96 when computing the internal consistency of his original instrument of 45 items regarding educational change and innovation.

*Scales to measure perceptions of influence.* A fourth section of the survey instrument attempted to measure the respondents' perception of actual and ideal influence exerted by four sources on her or his classroom procedures. From this it was posited that some influence exists in the school system which may influence a teacher's proneness toward the adoption of innovations. This influence may be the result of peer influence or administrative policy. The groups in question consisted of the school board, school superintendent, other vocational teachers, and academic teachers.

*A scale to measure adoption-proneness.* The final portion of the instrument package consisted of a scale to measure adoption-proneness; the dependent variable for this study. Adoption-proneness for this study was defined as an individual's perception toward the actual adoption of an idea, concept, or practice relating to vocational technical education. The items were taken from an instrument developed by Miller (1967) which purports to measure change-proneness with respect to the classroom teacher, principal, and superintendent. The majority of items concerned the actual selection or adoption of innovations and educational practices, and therefore, served as an ideal basis for the adoption-proneness scale. Furthermore, Miller (1967) conceptualized the items on the basis that mental flexibility, open-mindedness, and curiosity are essential preconditions for effective change and/or successful adoption of innovations.

Concurrent validity for this instrument was established by conducting a correlational analysis between the scores attained on this instrument and the number of ideas, practices, and products adopted by a group of 40 vocational teachers. A correlation of .44 ($p < .10$) indicated the inventory did provide some measure of adoption-proneness. Homogeneity was established by correlating each item of the inventory with the total score for the instrument. Analysis revealed that all coefficients were positive with a range of .31 to .81. Reliability was established by means of the split-half method. Here, the Spearman-Brown Formula indicated a reliability estimate of .95 for the 17-item instrument.

## Statistical Treatment

Multiple linear regression was chosen as the appropriate method of analysis for this study. Using the Maximum $R^2$ Improvement Technique developed by Goodnight (1972), each independent variable was analyzed for its contribution to the final equation. This procedure begins by first selecting the best one variable model which yields the greatest increase in $R^2$. After selecting the best one variable model, the technique then adds a second variable and so forth. In order to obtain the best regression equation for this study, certain preselected criteria were also established as determining factors. When any model failed to meet any of these criteria it was not considered for the final analysis. The criteria established were as follows: (1) the final model must have an F ratio significant at the .01 level or lower, (2) no model would be considered unless it demonstrated an increase of at least .10 in the coefficient of determination over a previously constructed model, and (3) any addition of a new independent variable should produce significance at the .10 level or lower.

Assuming that all variables contributed to the regression equation, the complete model would have contained nineteen predictor variables and one criterion variable. The complete model is as follows:

$$Y' = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{13}X_{13} + b_{14}X_{14} + b_{15}X_{15} + b_{16}X_{16} + b_{17}X_{17} + b_{18}X_{18} + b_{19}X_{19}$$

where

$Y'$ = predicted score on the adoption-proneness inventory

a = the intercept constant

$b_1 \ldots b_{19}$ = partial regression coefficients

$X_1$ = age of the teacher

$X_2$ = number of years in teaching

$X_3$ = level of educational achievement

$X_4$ = recency of professional education

$X_5$ = number of publications read monthly

$X_6$ = membership in professional organizations

$X_7$ = cosmopolitanism

$X_8$ = number of years teaching in the present school district

$X_9$ = score attained on the *Rokeach Dogmatism Scale*

$X_{10}$ = disposition toward changing teaching methods

$X_{11}$ = teacher's response toward finding teaching personally satisfying

$X_{12}$ = actual influence exerted on instructional procedures by the school board

$X_{13}$ = actual influence exerted on instructional procedures by the superintendent

$X_{14}$ = actual influence exerted on instructional procedures by vocational teachers

$X_{15}$ = actual influence exerted on instructional procedures by academic teachers

$X_{16}$ = ideal influence exerted on instructional procedures by the school board

$X_{17}$ = ideal influence exerted on instructional procedures by the superintendent

$X_{18}$ = ideal influence exerted on instructional procedures by vocational teachers

$X_{19}$ = ideal influence exerted on instructional procedures by academic teachers

In addition to the above nineteen independent variables, additional factors were considered in the regression model. For this study, the two distinct groupings of teachers, or the large public school system and the three remaining districts had to be considered for their effect. Another factor which could have had some effect was teaching area, e.g., Agriculture, Business and Office Education, and so forth. Therefore, the two geographical locations and seven teaching areas were considered as "dummy variables" in the analysis.

## FINDINGS

Survey instruments were mailed to 310 vocational teachers in the four districts previously described. Two weeks after the initial mailing, follow-up letters were sent to the teachers to encourage further responses. After follow-up activities were completed, 208 instruments were completed and returned to the investigator. From this number, 202 instruments were considered usable, giving an overall response rate of 65 percent.

The only difference noted between respondents and non-respondents was that more non-respondents were members of the large public school system. This did not create concern, as the actual difference between this district and the others amounted to only 8 percent.

### Regression Analysis

The Maximum $R^2$ Improvement Technique final regression model employed five predictor (independent) variables in explaining the criterion variable-adoption-proneness. The model included whether or not a teacher found teaching personally satisfying, the number of professional publications read monthly, age, the ideal influence a vocational teacher felt should be exerted on instructional procedures by academic teachers, and the number of years spent teaching in the present school district. Regression analysis for these variables can be found in Table 1.

Mathematically, this model can be expressed as follows:

$$Y' = 55.712 = .213X_1 + 1.276X_5 - .244X_8 + 3.213X_{11} + 1.269X_{19}$$

where

$Y'$ = predicted score of the dependent variable adoption-proneness
55.712 = the intercept constant
$X_1$ = age
$X_5$ = number of publications read monthly
$X_8$ = number of years teaching in present school district
$X_{11}$ = teacher's response toward finding teaching personally satisfying
$X_{19}$ = ideal influence exerted on instructional procedures by academic teachers

As noted in Table 1, four partial regression coefficients (b values) are positive with the exception of that for the number of years spent teaching in the present school district. It appears that those teachers who had spent less time in their present school districts tended to be more adoption-prone than their counterparts.

## Mean Scores of Variables

The criterion and independent variable mean scores and standard deviations for the districts and total sample are provided in Table 2. The score for variable 11 was based on a single response to a statement in the Likert format which asked the respondent to indicate the agreement or disagreement he or she felt toward finding teaching personally satisfying. A score of 1 indicated strong disagreement toward finding teaching personally satisfying, while a score of 6 indicated strong agreement. A respondent's score for variable 19 (the ideal influence exerted on instructional procedures by academic teachers) was based on a continuum which ranged from 1 (little or no influence) to 6 (a very great deal of influence). A score for the criterion variable was established by summing each of the 17 responses on the adoption-proneness inventory. Possible scores could have ranged from a low of 17 to a high score of 119. All remaining scores for significant independent variables were taken directly from survey instruments.

## Product Moment Correlation

A product-moment (zero order) correlation coefficient was calculated for each pair of numeric variables (all independent variables and the dependent variable), including the probability of significance. A number of these correlations were significant at the .05 level and some were significant at the .01 level (see Table 3). Intercorrelations ranged from −.288 to .925. Table 3 presents the correlation coefficients and their significance for the five significant independent variables and the criterion variable.

The results of this study appear to suggest that certain mental, physical and professional attributes exist among vocational teachers as determinants in explaining their proneness toward adopting educational innovations. The following sections discuss evidence in support of the findings in this study.

## Age

Results of the study indicated that age was positively correlated with the criterion variable adoption-proneness in that older teachers tended to score higher on the adoption-proneness inventory.

## TABLE 1

Regression Analysis between Five Independent Variables*
and the Dependent Variable Adoption-Proneness

| Source | DF | Sum of Squares | Mean Square | F Value | Prob > F | R-Square |
|---|---|---|---|---|---|---|
| Regression | 5 | 5013.893 | 1002.778 | 10.76 | 0.0001 | 0.2207 |
| Error | 190 | 17695.923 | 93.136 | | | |
| Corrected Total | 195 | 22709.816 | | | | |

| Source | DF | Sequential SS | F Value | Prob > F | Partial SS | F Value | Prob > F |
|---|---|---|---|---|---|---|---|
| Satisfaction | 1 | 2663.183 | 28.59 | 0.0001 | 1621.059 | 17.40 | 0.0002 |
| Publications | 1 | 1476.631 | 15.85 | 0.0003 | 1057.055 | 11.34 | 0.0013 |
| Age | 1 | 311.991 | 3.34 | 0.0652 | 583.781 | 6.26 | 0.0126 |
| Ideal Academic Teacher Influence | 1 | 274.738 | 2.94 | 0.0836 | 334.494 | 3.59 | 0.0563 |
| Years Teaching in Present District | 1 | 287.348 | 3.08 | 0.0768 | 287.348 | 3.08 | 0.0768 |

| Source | B Values | T for HO:B = Q | Prob > \|T\| | Std Error B |
|---|---|---|---|---|
| Mean | 55.7121 | | | |
| Satisfaction | 3.2139 | 4.17 | 0.0002 | 0.770 |
| Publications | 1.2762 | 3.36 | 0.0013 | 0.378 |
| Age | 0.2131 | 2.50 | 0.0126 | 0.084 |
| Ideal Academic Teacher Influence | 1.2696 | 1.89 | 0.0563 | 0.669 |
| Years Teaching in Present District | −0.2442 | −1.75 | 0.0768 | 0.139 |

* Satisfaction, Age Publications, Ideal Academic Teacher Influence, Years Teaching in Present School District

## TABLE 2
Means and Standard Deviations for the Five Independent and One Criterion Variable by District and Total Sample

| | Districts A, B, and C (N = 78) | | District D (N = 124) | | Total (N = 202) | |
|---|---|---|---|---|---|---|
| | $\bar{X}$ | SD | $\bar{X}$ | SD | $\bar{X}$ | SD |
| 1. Age | 38.35 | 11.93 | 38.73 | 10.86 | 38.58 | 11.26 |
| 5. Professional Publications Read | 2.75 | 1.56 | 3.21 | 2.08 | 3.03 | 1.91 |
| 8. Number of Years Teaching in Present School District | 8.98 | 7.13 | 8.65 | 6.56 | 8.78 | 6.77 |
| 11. Response Toward Finding Teaching Personally Satisfying | 5.12 | 0.69 | 5.01 | 1.04 | 5.05 | 0.92 |
| 19. Ideal Influence Exerted by Academic Teachers | 2.27 | 0.94 | 2.65 | 1.00 | 2.51 | 1.06 |
| 20. Adoption Proneness (Criterion Variable) | 85.05 | 10.25 | 85.23 | 11.29 | 85.16 | 10.88 |

## TABLE 3
Product-Moment Correlations among Six Variables Used in the Study (N = 202)

| | 1 | 5 | 8 | 11 | 19 | 20 |
|---|---|---|---|---|---|---|
| 1. Age | 1 | .23* | .67* | .17** | .51* | .22* |
| 5. Professional Publications Read | | 1 | .21** | .17** | .14** | .31* |
| 8. Number of Years Teaching in Present School District | | | 1 | .06 | .13 | .07 |
| 11. Response Toward Finding Teaching Personally Satisfying | | | | 1 | .00 | .34* |
| 19. Ideal Influence Exerted by Academic Teachers | | | | | 1 | .14** |
| 20. Adoption-Proneness (Criterion Variable) | | | | | | 1 |

* $p < .01$
** $p < .05$

Rogers and Shoemaker (1971, p. 352-354) found inconsistencies existed in the evidence presented between the relationship of age and innovativeness. Nearly 48 percent of the 228 studies they reviewed demonstrated no relationship, 19 percent showed that earlier adopters are younger, and 33 percent indicated they are older.

One possible explanation for the positive correlation found in this study might be the fact that as vocational teachers grow older they become more knowledgeable about their respective teaching areas and tend to seek out innovations which assist or improve on their instructional practices. Additionally, the study indicated that the mean age of the respondents was 35.58 years. From this one might speculate that many of the teachers were quite possibly selected for their present positions from the ranks of various industry or trade groups. As a result, they may have been exposed to various practices and techniques before entering the teaching profession.

Another plausible explanation may simply be a measure of the accumulation of certain practices over time, i.e., the older teachers become, the more time they have to adopt various practices. Younger teachers obviously have had less time to learn about, experiment with, and adopt a large number of innovative practices.

### Professional Publications Read Monthly

Analysis revealed that the number of professional publications read monthly correlated positively with a respondent's score on the adoption-proneness inventory. Others have found that those who read more literature and are more active in seeking of information tended to select and adopt more innovations than those who do not engage in such activities (Christiansen & Taylor, 1966; Averill, 1967; Lionberger, 1960; Verner & Gubbels, 1967). Rogers and Shoemaker (1971) also found earlier adopters tended to seek more information about innovations.

### Number of Years Teaching in the Present School District

An inverse relationship existed between number of years teaching in the present school district and a respondent's score on the adoption-proneness inventory. This appears to be in agreement with the findings of Rogers and Shoemaker (1971), and Carlson (1965). These authors found that persons who were more likely to accept and use innovative practices exhibited traits of both social and geographical mobility and lacked tenure in their present positions. Quite possibly, many of the individuals in this study were drawn from business and industry, explaining limited time spent in the teaching profession. Another explanation could be that they changed schools more frequently than non-adopters.

### Response toward Finding Teaching Personally Satisfying

Analysis revealed that those who scored higher on the adoption-proneness inventory tended to find teaching highly satisfying. This variable was also the first to enter into the regression equation, thereby contributing the maximum explained variance.

In synthesizing their clinical and statistical analysis concerning innovations, Rogers and Shoemaker (1971) described the innovator or earlier adopter as being highly satisfied with her or his work, resulting in increased productivity through the use of innovations.

### Ideal Influence Exerted by Academic Teachers

The final variable to enter the regression equation related to the ideal influence vocational teachers felt should be exerted on her or his classroom procedures by academic teachers. This variable correlated positively with the criterion variable, therefore, it appears that vocational teachers who are more adoption-prone desire more interaction with academic teachers and even consider the academic teacher a peer. Ross (1958), supporting this notion, found that contact among teachers was considered an important source for ideas concerning innovation and change.

## DISCUSSION

Certain cautions are in order concerning the use of multiple linear regressions as a means for arriving at useful predictor equations for studies similar to this one. The rather low coefficient of determination (explained variance) in this study attests to this fact. Yet, the findings seem to have utility for identification of vocational teachers in the adoption process. The significant predictor variables appear to be more descriptive or analytical. Therefore, one might identify adoption-proneness by an individual's score on the adoption-proneness inventory.

## REFERENCES

Averill, T. B. Educational participation and innovativeness. *Journal of Educational Research*, 1967, *10*, 443-49.

Carlson, R. O. *Adoption of educational innovations.* Eugene, Oregon: University of Oregon, The Center for Advanced Study of Educational Administration, 1965.

Christiansen, J. E., & Taylor, R. E. *The adoption of educational innovations among teachers of vocational agriculture, a digest of a Ph.D. dissertation*, U.S., Educational Resources Information Center, ERIC Document ED 016 783, June, 1966.

Dohmann, W. C. Teachers' perception toward innovations and change. Unpublished doctoral dissertation, University of Southern California, 1970.

Fullam, M. An overview of the innovation process and the user. *Interchange*, 1972, *2-3*, 1-46.

Goodnight, H. J. Maximum $R^2$ improvement. *A users guide to the statistical analysis system*, Raleigh: North Carolina State University, 1972, 128.

Gross, N., Giaquinta, J., & Bernstein, M. *Implementing organizational innovations: A sociological analysis of planned educational change.* New York: Basic Books, 1971.

Hood, F. F. Change orientation and perceptions of emerging professional roles held by teachers of home economics in Virginia (Doctoral dissertation, Texas A & M University, 1975). *Dissertation Abstracts International*, 1976, 36, 4083A-5602A. (University Microfilms No. 76-3646, 243).

Lionberger, H. F. *Adoption of new ideas and practices.* Ames: Iowa State University Press, 1960.

Lippit, R., & Havelock, R. *Needed research on research utilization from research implications for education diffusion: Major papers presented at national conference on diffusion of educational ideas.* U.S., Educational Resources Information Center, ERIC Document ED 026 535, March, 1968.

Miller, R. I. *Innovation in education.* New York: Appleton-Century-Crofts, 1967.

Mort, P. R., & Cornell, F. G. *American schools in transition.* New York: Bureau of Publications, Teachers College, Columbia University, 1941.

Rogers, E. M. What are innovators like. In R. O. Carlson (Ed.), *Change processes in the public schools.* Eugene: University of Oregon, 1965.

Rogers, E. M., & Shoemaker, F. F. *Communication of innovations: A cross cultural approach.* New York: The Free Press, 1971.

Rokeach, M. *The open and closed mind.* New York: Basic Books, 1960.

Ross, D. H. *Administration for adaptability: A source book drawing together the results of more than 150 individual studies related to the question of why and how schools improve.* New York: Metropolitan School Study Council, 1958.

Tardanico, P. J. Change receptivity of writers and non-writers of occupational education proposals with implications for guidelines for pre-assessment of change-oriented educators (Doctoral dissertation, Temple University, 1974). *Dissertation Abstracts International*, 1974, *35*, 3181A-3939A.

Troldahl, V. C., & Powell, F. A. A short-form dogmatism scale for use in field studies, *Social Forces*, 1965, 211-14.

Verber, C., & Gubbels, P. *The adoption or rejection of innovations by dairy farm operators in the Lower Fraser Valley.* U.S., Educational Resources Information Center, ERIC Document ED 012 882, June, 1967.

## Synthesis

This portion of the vocational curriculum and instruction research section serves to point out certain aspects of the example studies and provide further direction for research in the area. As one might imagine, identifying relatively homogeneous studies is virtually impossible. The reader will thus find it necessary to make appropriate cognitive leaps from one study to another, drawing as necessary from the research review at the beginning of this section.

### O'NEIL AND NELSON STUDY

O'Neil and Nelson focus their research on a critical aspect of curriculum content: occupational survival skills. The authors begin by indicating that a person typically makes several career changes during his or her working years. They note that identification of a common core of skills would permit programs to be established which aid in worker survival. Several methodological considerations in the study are worthy of note. First, a telephone survey instrument was utilized to gather data in an accurate and expeditious manner. Secondly, data were gathered from a random sample of workers representing the general population. While these approaches have certain inherent limitations, they appear most appropriate for the kinds of data which were needed.

Results revealed that eleven of the skills were rated as very important for job maintenance by at least 50 percent of the total respondents. Discriminant analysis results were of even greater importance since they revealed the contributions skills made to maximum separation of occupational groups. In this instance, there appeared to be seventeen skills which did not contribute appreciably to any significant differences.

This study reflects the type of fresh and creative exploratory effort which is necessary if we are to deal properly with complex curriculum content. In addition to searching for non-technical employment skills (a most difficult task in and of itself), the authors chose to utilize statistical analyses which focused on the multidimensional aspects and perceptions of work. The use of relevant statistical techniques such as discriminant analysis should aid us greatly in the continued study of vocational education curriculum content.

### STEWART, LASH, AND KAZANAS STUDY

The study conducted by Stewart, Lash, and Kazanas examined principle learning in a vocational setting. Early on, the authors note a need to meet individual students' learning needs and the failure of teachers to provide for learning style differences, particularly as these differences are associated with verbal ability. This investigation not only examined effects due to treatments (different verbal formats) but also took ability levels (reading ability) into account. Benefits gained by such a design are obvious; results may point to differential effects across ability levels which would have greater implications for instructional design.

Experimental research in applied settings is most difficult to conduct. The investigators rose to meet this challenge, utilizing students in an area occupational school and following appropriate procedures for randomization of subjects. Results revealed several significant differences between groups, however, a lack of consistency in findings emerged. This situation occurs quite often in applied research and is a problem with which any investigator should be prepared to deal. The authors discussed the results in detail and provided plausible explanations of why certain inconsistencies may have occurred. The design of this study (treatments by levels) provided a more meaningful base for discussion, giving the reader greater insight into what may have taken place. If the investigators had chosen only to examine treatments, the explanation process would have been much more difficult to carry out.

## KIZER AND SCRUGGS STUDY

When a persistent problem exists in education, a researcher is sometimes better off exploring certain phenomena associated with it and using results as a basis for planning further research. The tie between teacher behavior and student achievement is clearly one of these problems and perhaps represents an ultimate challenge to researchers. Kizer and Scruggs managed to deal with this problem systematically, using a conceptual model as a basis for their investigation. Because of its ex post facto nature, this study necessitated the establishment of very precise data gathering procedures. Instruments needed to be sensitive enough to assess variation among teachers as well as among students.

While the results may appear to lack specificity, it should be noted that there were no hypotheses or research questions associated with the study. When more fundamental research is initiated in a particular area, being less specific may aid in determining what various processes consist of, thus contributing to the formulation of hypotheses in later studies. Since results tended to support the notion that relationships exist between teacher behavior and student achievement, researchers may feel more confident about using larger, more cumbersome samples and developing more sophisticated instrumentation. When pursued wisely, exploratory research efforts make a most meaningful contribution to our knowledge about instruction and learning.

## OSCARSON STUDY

The study reported by Oscarson focused on an area that many researchers have ignored: the adoption of innovations in education. The author first cites a need to explore this area, particularly since many innovations are placed in schools without any knowledge of how they are accepted or rejected. Rogers and Shoemaker's innovation-decision process paradigm served as a conceptual framework for the study, however, the investigator elected to specifically test the antecedent conditions of this paradigm. Variables were selected based upon results of related studies. Instruments associated with these variables represented an interesting mix. Some instruments were already available while others needed to be validated by the investigator. This situation is often the case when a researcher builds a study from a theoretical or conceptual base.

Multiple linear regression (MLR) was utilized to account for the 19 independent variables, and nine concomitant variables (geographical areas and teaching areas). There is clearly a benefit which can accrue for the investigator using MLR. By partialing out the effects of certain variables, relationships may be more sharply defined.

Results suggest that certain of a teacher's personal characteristics serve as determinants in explaining proneness toward adopting educational innovations. It may be noted that results are woven back into previously conducted research, thus serving as a bridge to fundamental knowledge about the area. This process can be extremely valuable since it aids in clarifying relationships among variables.

## IMAGES OF THE FUTURE

Perhaps the past and present *can* tell us something about the future. It is reasonably clear that past research efforts in vocational curriculum and instruction have tended to consist of separate problematic activities. And, while some of the more recent research has shifted away from a problematic mode, the number of researchers engaged in long term efforts is indeed small.

As Pratzner and Walker (1972) point out, programmatic research "is a rational means for effectively allocating scarce resources toward the reduction of persistent educational problems." Certainly, programmatic research cannot solve all of our problems; however, it may easily serve as a focal point when solutions are sought to complex problems. Even though the use of programmatic research requires long range planning, financial support and personal commitment, it appears to be a needed part of our future research agenda. While the past looks rather bleak and the present does not appear to be a great deal better except perhaps in the curriculum content area, our future will be greatly influenced by the extent to which systematic, programmatic research activities are conducted. Hopefully, both researchers and funding will be available to carry on needed research studies in vocational curriculum and instruction. It is only in this manner that we can meet the challenges of the future.

## SYNTHESIS REFERENCE

Pratzner, F. C., & Walker, J. P. *Programmatic research and development in education: Positions, problems, propositions.* Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1972. (ERIC Document Reproduction Service No. ED 069 844)

# SECTION THREE

## Research on Vocational Education Programs for Special Populations

---

L. ALLEN PHELPS
University of Illinois
at Urbana-Champaign

# Research Review

## INTRODUCTION

The design and delivery of career development programs for special needs populations continues to be an emerging national priority for the education and employment communities. The critical need for viable vocational and career education programming for the handicapped, minorities, the disadvantaged, limited English speaking populations, and other special needs groups has been reflected in numerous pieces of federal legislation since the early 1960's. The Vocational Education Amendments of 1976, as well as Public Law 94-142, Sections 503 and 504 of the Rehabilitation Act of 1973, and the Comprehensive Employment and Training Act of 1978, speak to the need for these populations to have full access to appropriate training programs that will lead to productive, meaningful, and satisfying employment. While the proliferation of mandates has been rapid, the actual development or expansion of programs has occurred at a less rapid rate. As this review will substantiate, the restricted rate of development and expansion of programs is due, to a large extent, to fragmented and limited research, development, and dissemination efforts. Certainly, one of the major purposes of research and development programs is to expand the capability of practitioners to respond to new and emerging trends in the field (e.g., the mainstreaming of special needs students into regular vocational classes). The extent to which this has occurred in this priority area has been influenced by a number of factors. The factors include, but are not necessarily limited to: (1) limited research funding, (2) poor and limited research dissemination efforts, (3) insufficient attention by vocational education researchers to the need for research in this priority area, (4) lack of baseline, needs assessment studies to determine the most significant problems requiring research, (5) poor or nonexistent research designs for early research and development efforts, and (6) failure to integrate and build upon research in related disciplines, most notably the fields of vocational rehabilitation and special education.

This review of research related to vocational education for special needs populations has several purposes. First, it provides a comprehensive overview from which future annual reviews can examine specific issues or specific special needs populations. It also serves as a benchmark from which the field can measure the progress of programming and research into the 1980's. An additional thrust is to identify and stimulate research and program improvement activities in areas of critical need. Finally, the review seeks to assist individual researchers, as well as administrators of research and development programs at the local, state, university, and federal levels to plan and articulate their research efforts in this area.

At the outset, it is important that the parameters of the review be identified. Approximately 100 research abstracts, articles, and products were reviewed. The search was limited to research dealing with vocational education and career education programs as they are defined in federal legislation, i.e. P.L. 94-482 and P.L. 95-207 respectively. Research was reviewed which focused on the handicapped, disadvantaged, and limited English speaking populations. Reviews focusing on women and CETA-eligible clients, which frequently are also considered special populations, are presented in other sections of this volume.

For purposes of this review, research was broadly defined. Research was operationally defined to encompass a number of activities that have as a common goal the improvement of vocational programs for special needs populations. Reports and products from research and development projects, curriculum and program development activities, innovative, exemplary, and demonstration grants, and teacher training projects were reviewed. Thus, a diverse set of perspectives and differing types of studies are reflected herein.

## REVIEW OF RESEARCH: 1975-79

The preparation of a comprehensive literature review on vocational education research for special needs populations is a monumental charge. Indeed, if done adequately, the review could fill several volumes. Given the limited space and the comprehensive nature of the studies selected for the review, the section editor chose to address, in a rather cursory manner, four major special populations. The following sections will acquaint the reader with a sampling of major research and development projects that have targeted upon improving vocational education for limited English speaking, handicapped, incarcerated, and disadvantaged learners.

### Research on Vocational Education for Limited English Speaking Learners

The projects reviewed in this section focus predominantly on bilingual instructor training and adoption of vocational curriculum materials for the limited English speaking students. Here, as with other special needs populations, the overriding concerns appear to address teaching materials and the preparation of instructors to accommodate the limited English speaking student.

Smith (1976) produced a production-ready, basic prevocational course in English-as-a-second-language using an audio-visual format. The course, which also includes teacher materials, can be used with persons from any home-language.

Cohen (1976) assessed the career aspiration and self-congruence of Puerto Rican youth through the use of standardized instruments. The results were used to develop a pilot career awareness/orientation curriculum for use in bilingual schoolrooms in Connecticut.

Clark (1976) conducted a study that examined the effect of Spanish-English bilingualism on the acquisition, retention, and transfer of vocational concepts for students enrolled in vocational education programs.

Todd (1976) developed a prototypic model for modifying and adapting existing vocational education curriculum materials for use with students of limited English speaking ability. A Modular Procedural

119

Guide was developed for use by vocational and bilingual curriculum specialists in the modification of materials.

Ellis (1976) has completed a project which includes a series of bilingual metric education modules for use in post-secondary and adult vocational education programs.

Beaudoin (1976) conducted a project to design and develop bilingual/bicultural instructional materials (French-American) for the human service occupations in Vermont. A state-wide dissemination of the materials was conducted.

Brady (1978) conducted a major project examining bilingual vocational education instructor competencies. A monograph was prepared outlining the minimum competencies needed by instructors in bilingual vocational training programs. In addition, a criterion-referenced test for competency assessment was developed. Four national dissemination workshops were held in various regions of the nation.

Galvan, Ramey and Gonzalez (1978) have completed the initial phase of a development test of English proficiency for adults of limited English speaking abilities. The project focuses on the development of a comprehensive vocational contextual basis for the adult participant in bilingual vocational training programs and produced a test with two equivalent forms to measure the participant's proficiency of language skills used in the English-speaking working environment.

The Bureau of Occupational and Adult Education, U.S. Office of Education annually funds several bilingual vocational education programs and bilingual vocational instructor training programs. Some 14 projects in seven different states were funded during FY 1978. Training for students and instructors was provided for such languages as Spanish, Vietnamese, Chinese, Filipino, and various dialects of American Indian. Most of the projects emphasized training in entry level occupations in such fields as construction, dental assisting, foods service, plastics, clerical/secretarial, auto mechanics, and accounting. Since the programs were focused on training and instructor training exclusively, research products were not generated. However, the existence of such programs provides a significant opportunity for pursuing a broad range of research questions related to vocational instruction of the student with limited English speaking ability.

### Research on Vocational Education for Handicapped Learners

Most of the studies reviewed on handicapped students focused on mainstreaming concerns. Several projects were concerned with the identification of barriers and the subsequent development of media and inservice materials to aid vocational educators in overcoming the identified barriers. Most projects addressed teacher concerns and interventions while a fewer number of projects addressed teacher and administrator concerns.

Nystrom (1976) has completed a project to analyze existing barriers, forecast potential problem areas, and prescribe professional development solutions to mainstreaming handicapped students into vocational education programs. A set of instructional modules on effective mainstreaming strategies was prepared for use by special and vocational education administrators, guidance personnel, and teachers.

Kaufman (1976) has conducted a project to examine the labor market effects of occupational education programs for the physically handicapped. The study examined the availability and utilization of secondary school occupational education programs and the costs of alternative programs and their effectiveness, in terms of the labor market experiences of the program graduates.

Costello (1976) has conducted a project to assess the vocational potential of hearing impaired mentally retarded individuals in a variety of institutional and community settings. An instrument (the Rehabilitative Skill Inventory) was developed and validated as a part of the research.

Shill (1976) has completed a research project to develop and test criteria for the identification and selection of mentally handicapped students for vocational programs. The criteria are applicable for enrolling students in "special vocational education programs" and for allowing selected mentally handicapped students to enroll in regular vocational education programs.

Fowler and Schwartz (1976) have developed a set of self instructional booklets for changing the attitudes and procedures of educators and administrators in regard to integrating handicapped students into vocational education programs.

Tindall (1978) has completed a project to formulate goals and procedures for analyzing, revising, and developing vocational education programs for the handicapped in Wisconsin's 16 VTAE districts during 1977-82.

Hughes (1976) has recently finalized a project in North Carolina to identify needs and barriers to mainstreaming as expressed by occupational education personnel who occupy key roles with respect to implementation of the "least restrictive environment" concept. A set of policy recommendations was formulated.

Abeson and Davis (1976) have completed the development and dissemination of an administrative policy manual for vocational education of the handicapped. The manual contains exemplary and suggested policies for local education agencies regarding the provision of appropriate vocational education sevices to all handicapped children.

Dahl, Appleby and Lipe (1976) have prepared a practical guidebook for vocational educators to assist them in identifying and overcoming the barriers to mainstreaming.

The Contract Research Corporation has recently completed a project to develop tools (a user's guide and training package) needed by vocational educators in order to develop individual education plans (IEPs) for handicapped students. As a part of the project, training was provided to state level personnel for their use in vocational education, special education, vocational rehabilitation, guidance and counseling, and CETA programs.

Smith (1978) has completed the development of a media presentation (film) on mainstreaming of the handicapped in secondary vocational education programs under a contract with the Bureau of Occupational and Adult Education.

Rice (1978) is presently engaged in the development and validation of a planning process for improving the accessibility to vocational education programs and facilities for handicapped persons at the local education agency level. A training package, including a media presentation for local administrators, is also under development.

Pope and Kienast (1978) have recently completed a project to improve the vocational instructional delivery system for handicapped individuals. The project identified those competencies and knowlege required of vocational educators to instruct handicapped learners.

### Research on Vocational Education in Corrections

A number of national and state level exploratory studies have been funded to examine vocational needs and training programs in correctional settings. Several of the projects are focused on female and youth offenders.

Kaufman (1976) has completed a study of the quality and results of vocational education in correctional institutions. Among the factors evaluated in the multi-institution study were: (1) quality of the vocational program, (2) level of skill attainment of program participants, and (3) the educational climate of the institution.

Pershing (1976) has formulated a comprehensive master plan for vocational education in the correctional institutions of Missouri. Drewes (1976) has developed a procedure and related instrumentation for assessing correctional vocational education needs in North Carolina. Nuttall (1976) conducted a similar study for youth under the custody of the Massachusetts Department of Youth Services.

In a project conducted at Virginia Polytechnic Institute and State University, Looney (1976) has formulated a model curricula and prototype instructional materials for use in upgrading the occupational skills of adult women offenders.

Rice (1978) has conducted a state-of-the-art assessment of vocational education programs in correctional institutions in D.H.E.W. Region IV. The critical characteristics of vocational education programming provided in all juvenile and adult public correctional facilities were identified. In addition, innovative procedures/techniques/practices were described.

Whitson (1976) at The National Center for Research in Vocational Education, The Ohio State University, conducted a comprehensive study of vocational education in corrections. The study focused on the development of a set of standards for program design, operation, and outcome evaluation. A national survey of programs was conducted to identify major needs, problems, and issues.

Wiederanders (1976) assessed the "job survival skills" of youthful offenders and developed a modularized curriculum to meet the identified needs. The job survival skills of both paroled and incarcerated youth were studied.

Jenkins (1978) is currently involved in a project examining the needs of women offenders. The project, to be completed in March, 1980, will review the vocational programs for women offenders within state and community-based correctional systems, and identify and document successful vocational training programs.

## Research on Vocational Education for Disadvantaged Learners

A review of the vocational education research literature notes only two recent studies on vocational education for the disadvantaged. Since the early 1970's it appears that the disadvantaged population, as a research and program improvement priority in vocational education, has dropped from the scene at the state and national level. This is somewhat perplexing if one carefully studies the national assessment study of vocational education programs for the disadvantaged, which is reviewed in depth in the following section. There are a number of major, recurring problems associated with the delivery of vocational education to the academically and economically disadvantaged. A partial answer to the paucity of research undertaken by the vocational education community is attributable to the growth of CETA programs. Increasingly, employment and training programs are attempting to serve in-school and out-of-school economically disadvantaged youth. Numerous CETA-vocational education linkage activities have been initiated at the local, state, and national levels.

Farmer (n.d.) surveyed 240 vocational administrators and teachers in several large cities in Pennsylvania to determine some pedagogical competencies that met the needs of inner-city disadvantaged youth. The major recommendations of the study included: (1) the conduct of more preservice and inservice workshops, conferences, and seminars concerning the diverse cultural and socioeconomic backgrounds of students in order to improve the effectiveness of inner-city teachers, (2) increased recruitment of minorities for administrative and teaching positions in vocational education, and (3) the inclusion of more interdisciplinary content in teacher education programs related to issues dealing with the disadvantaged.

Wircenski (1978) completed a major state-wide project in Pennsylvania focused on meeting the needs of vocational teachers of the disadvantaged. The objectives of the project included: (1) determining the state-of-the-art in vocational education programming for the disadvantaged in Pennsylvania and nationally, and (2) developing materials that would aid in improving vocational programs for the disadvantaged. Three products were developed and tested: (1) a curriculum guide for work related skills, (2) a system for the identification and assessment of disadvantaged students, and (3) an instructor profile to aid in the selection and development of staff.

## Research on Vocational Education for Special Needs Learners

Some researchers have chosen to examine the delivery of vocational education to special populations from a comprehensive perspective; that is, to consider several special groups collectively as a group of learners or students with "special needs."

Albright, Evans and Fabac (1978) developed and tested a system for the identification, assessment, and evaluation of special needs learners in vocational education programs. A series of nine guides were prepared for vocational teachers and administrators to use in implementing an assessment and evaluation system for special needs students.

Phelps (1976) conducted a formative field test evaluation of seven inservice teacher education modules. The modules were designed for use by teams of vocational and special educators, and provided a system for developing, implementing, and evaluating instruction for the special needs learner.

Malek (1978) is completing a project at The National Center for Research in Vocational Education, The Ohio State University entitled "Responsive Vocational Education for Special Needs Populations." The project is designed to train teachers, counselors, and administrators to recognize and respond effectively to special needs. A set of descriptive texts and technical briefs are being developed that describe the priority common and unique needs of special needs populations, including the gifted and talented, handicapped, bilingual, prisoners, migrants, and minorities.

Drewes, Heath, Katz, Spetz, and Thomas-Gordon (1979) are involved in the design and development of a comprehensive planning system for states to use in selecting planning strategies for providing vocational education to special populations. The major tasks for the planning system are structured around the federal Management Evaluation Review for Compliance Quality procedure used by the U.S. Office of Education.

## OVERVIEW OF FOUR LIGHTHOUSE STUDIES

The companion studies conducted by the Olympus Research Corporation in 1974 and 1976 examine the status of programming on a national scale for the handicapped and disadvantaged. Both studies examined policies, programs, and services at the state, local, and project level. At the state level, the variables studied included: management information systems, organizational factors, interagency relationships, planning, funding, and evaluation. At the local school district and/or project level, factors such as enrollment characteristics and trends, planning and administration, work experience program components, student selection practices, and instructional offerings were studied.

The Iowa Vocational Education/Special Needs Assessment Study involved mail survey responses from 1,265 vocational education instructors in the state at the secondary level. The principal purpose of the study was to determine the extent to which services were being provided to disadvantaged and handicapped students in vocational classes and the areas of support which need attention. The results of the study were used in the administration of programming reflected in the Iowa State Plan for the Administration of Vocational Education. Among the major factors examined in the study were: professional backgrounds and attitudes of instructors, services available to special needs students, class enrollment data, and identification of problem areas and suggested solutions.

The fourth state-of-the-art study was commissioned by the Minnesota State Legislature in 1977 for the purpose of determining future program needs for services to handicapped or disadvantaged students in vocational-technical education. This, also, was a state-wide needs assessment study. However, only existing data were used to provide the best possible description of the present need for services to special needs individuals who could benefit from vocational education. More specifically, the objectives of the study were to: (1) define and specify identification criteria, (2) estimate the prevalence of persons who are handicapped and disadvantaged, (3) list and describe the present services being provided, and (4) identify the sources and relative allocations of federal and state funds used to support special needs individuals in vocational-technical education programs.

## REVIEW REFERENCES

Abeson, A. and Davis, S. Development, assessment, and dissemination of an administrative policy manual for the vocational education of the handicapped: Project proposal. Reston, Virginia: The Council for Exceptional Children, 1976.

Albright, L., Fabac, J. and Evans, R. E. *A system for identification, assessment, and evaluation of special needs learners in vocational education.* Urbana: Bureau of Educational Research, University of Illinois, 1978.

Beaudoin, M. F. Bilingual bicultural instructional resources for vocational education/training in human services: Project proposal. Bangor, Maine: Bangor Community College, 1976.

Brady, M. E. Bilingual vocational education instructor competencies: Project proposal. Washington, D.C.: Kirschner and Associates, 1978.

Clark, D. L. A study of the acquisition of vocational concepts by bilingual students in vocational education programs: Project proposal. College Station: Texas A & M Research Foundation, 1976.

Cohen, J. S. Career aspiration and self-congruence in the education for Puerto Rican youth: Project proposal. New Haven, CT: Area Cooperative Educational Services, 1976.

Contract Research Corporation. Individual education plans for handicapped students in vocational education: Project proposal. Belmont, Massachusetts: author, 1978.

Costello, D. Vocational rehabilitation of the hearing impaired mentally retarded: Project proposal. Dixon, Illinois: Dixon Developmental Center, Department of Mental Health and Development Disabilities, 1976.

Dahl, P. R., Appleby, J. A., and Lipe, D. Overcoming barriers to mainstreaming: a problem solving approach: Project proposal. Palo Alto, CA: American Institutes for Research, 1976.

Drewes, D. W. Vocational education and corrections: An assessment of opportunities and needs: Project proposal. Raleigh, NC: Conserva, Inc., 1976.

Drewes, D. W., Heath, W. D., Katz, D. S., Spetz, S. H., and Thomas-Gordon, S. L. State planning for the delivery of vocational education to special populations: A state of the art report. Volume I — planning procedures. Raleigh, NC: Conserva, Inc., 1979.

Ellis, M. L. Bilingual metric education modules for postsecondary and adult vocational education. College Park, Maryland: Ellis Associates, Inc., 1976.

Farmer, E. I. Pedagogical competencies: Instructional alternatives for teachers serving the disadvantaged: Executive summary. Philadelphia: Temple University, n.d.

Fowler, R. E. and Schwartz, S. Research and development of instructional booklets for vocational educators of the handicapped: Project proposal. Gainesville: University of Florida, 1976.

Galvan, M., Ramey, E., and Gonzalez, G. Test of English proficiency for adults of limited English speaking ability: Project proposal. Austin, Texas: Resource Development Inst., Inc., 1978.

Greenwood, C. S. and Morley, R. E. Iowa vocational education/special needs assessment project. Des Moines: Iowa State Department of Public Instruction, 1978.

Hughes, J. H. Mainstreaming the handicapped in preparatory occupational education programs in North Carolina: Project proposal. Chapel Hill, NC: Systems Sciences, Inc., 1976.

Jenkins, E. B. Vocational needs for women offenders: Project proposal. Washington, D.C.: One America, Inc., 1978.

Kaufman, J. J. The quality and results of vocational education in correctional institutions: Project proposal. University Park, PA: Institute for Research on Human Resources, Pennsylvania State University, 1976.

Kaufman, J. J. Labor market effects of occupational education programs for the physically handicapped: Project proposal. University Park, PA: Institute for Research on Human Resources, Pennsylvania State University, 1976.

Looney, E. F. Developing program models and prototype training materials to meet occupational training needs of adult women offenders from a correctional institution: Project proposal. Blacksburg, VA: Virginia Polytechnic Institute and State University, 1976.

Malek, S. J. Responsive vocational education for special needs subpopulations: Project proposal. Columbus: National Center for Research in Vocational Education, Ohio State University, 1978.

Nuttall, R. L. Development of a plan to provide vocational education services to youth under the custody of the Massachusetts Department of Youth Services: Project proposal. Chestnut Hill, MA: Boston College, 1976.

Nystrom, D. C. A research and development project to analyze existing barriers, forecast potential problem areas, and prescribe professional development solutions to mainstreaming handicapped students into vocational education programs: Project proposal. Louisville: Department of Occupational and Career Education, University of Louisville, 1976.

Olympus Research Corporation. An assessment of vocational education programs for the handicapped under Part B of the 1968 Amendments to the Vocational Education Act. Salt Lake City, Utah: author, 1974.

Olympus Research Corporation. An assessment of vocational education programs for the disadvantaged under Part A and Section 102(b) of the 1968 Amendments to the Vocational Education Act. Salt Lake City, Utah: author, 1976.

Pershing, J. A. A project to design and develop a comprehensive master plan for vocational education in the correctional institutions of Missouri: Project proposal. Columbia: Curators of the University of Missouri, 1976.

Phelps, L. A. Instructional development for special needs learners: An inservice resource guide. Urbana: Department of Vocational and Technical Education, University of Illinois, 1976.

Pope, B. and Kienast, K. Personnel training requirements to serve handicapped populations: Project proposal. Richardson, Texas: Education Personnel Development Consortium D., 1978.

Public Law 94-142 (1975). Education for all Handicapped Children Act of 1975.

Public Law 94-482 (1976). Vocational Education Amendments of 1976.

Public Law 95-207 (1978). Career Education Incentive Act.

Public Law 95-524 (1978). Comprehensive Employment and Training Act Amendments of 1978.

Rice, E. Accessibility to vocational education facilities and programs for handicapped persons: Project proposal. Chapel Hill, North Carolina: System Sciences, Inc., 1978.

Schneck, G. R., Lerwick, L., and Copa, G. H. Assessment of the prevalence and service need requirements of handicapped and disadvantaged students in vocational-technical education programs in Minnesota. Minneapolis: Minnesota Research and Development Center for Vocational Education, University of Minnesota, 1978.

Shill, J. F. Development and testing of criteria for the identification of and selection of mentally handicapped students for vocational programs. Project proposal. Mississippi State, MS: Vocational and Technical Education, Mississippi State University, 1976.

Smith, P. D. A home language-free adult prevocational and audiovisual course in English-as-a-second language: Project proposal. West Chester, PA: West Chester State College, Educational Development Center, 1976.

Smith, R. Media presentations on mainstreaming the handicapped: Project proposal. Boston, Massachusetts: WGBH-TV, 1978.

Tindall, L. W. Modifying vocational curriculum for the handicapped: Project proposal. Madison: Wisconsin State University System, 1978.

Todd, R. D. Vocational and bilingual curriculum development: a cooperative effort: Project proposal. New York, NY: School of Education, New York University, 1976.

Vocational Rehabilitation Act of 1973 Section 503.

Vocational Rehabilitation Act of 1973 Section 504.

Whitson, C. A national study of vocational education in corrections: Project proposal. Columbus, OH: Center for Vocational Education, Ohio State University, 1976.

Wiederanders, M. Assessment of needs among youthful offenders related to job survival skills and development of modularized curriculum to meet these needs: Project proposal. Sacramento: State of California Department of Youth Authority, 1976.

Wircenski, J. L. Meeting the needs of teachers of disadvantaged programs in Pennsylvania: Final report (Project No 94-8032). University Park: Department of Vocational Education, The Pennsylvania State University, September, 1978.

# An Assessment of Vocational Education Programs for the Disadvantaged under the 1968 Amendments to the Vocational Education Act: A Summary

JOHN WALSH and
JAN L. TOTTEN
Olympus Research
Corporation

## BACKGROUND

Six years after the passage of the Vocational Education Act Amendments of 1968, the Office of Planning, Budgeting, and Evaluation of the U.S. Office of Education contracted with Olympus Research Centers (ORC) to perform a nation-wide assessment of the Act's provisions that deal with vocational education programs and services for the disadvantaged, or "... persons (other than handicapped persons) who have academic, socioeconomic, or other handicaps that prevent them from succeeding in the regular vocational education program." Part B of the Act, which requires state and local matching of federal funds, provides that 15 percent of basic grants to the states be used for the provision of vocational education programs and services to the disadvantaged, and Part A, Section 102(b) provides 100 percent funding of vocational education programs for the disadvantaged.

## PURPOSES OF THE ASSESSMENT

The purposes of the assessment, as specified by the U.S. Office of Education, were as follows:

(1) To provide information about how the states set priorities and allocate funds for vocational education services and programs for disadvantaged students
(2) To identify and analyze the various policies, decisions, or strategies within the community setting, such as coordination of resources for the disadvantaged, special legislation and planning, which directly or indirectly impact on the quality and effectiveness of vocational education programs for disadvantaged students (in terms of quality of training opportunities, instruction, services available, job placement, and so forth)
(3) To perform an assessment of a variety of secondary and post-secondary projects for the disadvantaged, including interviews with samples of students and employers participating in the projects, and a sample of employers not participating
(4) To identify and analyze existing constraints or limitations in carrying out the various vocational education programs

## METHODOLOGY

The assessment was conducted at the state, community, and project levels, and interviews were conducted with students and employers who were participating in the program. The term "community" was defined as "the local education jurisdiction" (local education agency or community college district) in which a sample project was located. The samples selected consisted of the following:

(1) States — 23
(2) Communities — 77

---

JOHN WALSH and JAN L. TOTTEN are with the Olympus Research Corporation, Salt Lake City, Utah.

    - (a) Local education agencies (LEAs) — 55
    - (b) Community college districts — 22
- (3) Projects — 84
    - (a) Secondary — 62
    - (b) Post-secondary — 22

At the state level, interviews were conducted with state directors of vocational education and their subordinates in charge of programming for the disadvantaged. At the community level, interviews were conducted with chairmen of members of boards of education or boards of regents, superintendents of schools or presidents of community colleges, and LEA or community college officers in charge of vocational education. Finally, at the project or school level, one interview schedule was used, but several respondents — including project directors, counselors, instructors, and school principals — contributed answers to various sections of the schedule.

Students participating in a subsample of projects located in states where the percentages of work experience programs were high were interviewed. A total of 1,024 student interviews were conducted. In the case of work experience programs, a sample of 103 participating employers was also interviewed.

## ORGANIZATION OF THE SUMMARY

The findings, conclusions, and recommendations of the study have been summarized in the following four sections:

- (1) Interpretation of the term "disadvantaged"
- (2) Policy and administration
- (3) The program
- (4) Recommendations

## THE MEANING OF "DISADVANTAGED"

The attempt was made in this study to determine the following:

(1) How state and local administrators define the term "disadvantaged"

(2) The various eligibility criteria promulgated by state and local administrators

(3) The various types of individual assessments performed for students enrolled in vocational education programs for the disadvantaged

## FINDINGS AND CONCLUSIONS

The evidence compiled warrants a number of findings and conclusions.

(1) State and local administrators had given little attention to interpreting the congressional definition of "disadvantaged student." As a result, programs differed widely between states and between communities within states.

(2) Few states or local communities had issued eligibility criteria for enrollment in disadvantaged programs, other than those contained in suggested federal guidelines.

(3) The reasons for the act's emphasis on individual assessment was not well understood at either the state or local levels. In most instances, individual assessment was merely a means of documenting the disadvantaged status of students enrolled in Part B set-aside and Section 102(b) projects. The question as to whether programs could be designed to meet the individual needs of students, discovered through individual assessments, was not often asked by state and local administrators.

(4) The most common criterion used to identify disadvantaged students was academic, that is, students who were one or more grade levels behind their peers.

(5) Half of the project directors interviewed in connection with the project-level assessment did not believe that the students enrolled in their projects were disadvantaged, thereby illustrating the confusion that exists from the state to the local level concerning the meaning of "disadvantaged student."

It appeared, therefore, that most states had devoted very little attention to the conceptualization of special vocational education services for the disadvantaged, based on specific criteria for the identification of disadvantaged students and individual assessments of students either eligible or potentially eligible for such services.

## POLICY AND ADMINISTRATION

In this section, the following subjects are summarized: (1) overview of national statistics pertaining to the disadvantaged Part B set-aside provision of the 1968 amendments; (2) allocation of resources at the community level; (3) state and local policy and administration of the Part B set-aside and Section 102(b) program; and (4) constraints, as perceived by state and local administrators, limiting the initiation of vocational education programs for the disadvantaged.

### National Statistical Overview

The most important conclusion that could be drawn from an analysis of the data that states report to the federal government each year is that they appear to contain anomalies which are difficult to explain. The wide ranges between states in the percentages of Part B funds expended for the disadvantaged, per enrollee costs, and data which appear to indicate that the costs for educating disadvantaged students are lower than those for educating regular students, bring into question the accuracy and completeness of the state-reported data. The probable reasons for these anomalies are that state definitions of the term "disadvantaged" vary so much that it is impossible to make interstate comparisons and that states report only partial, rather than actual, per-student costs.

### Allocation of Resources (Community Level)

Two analyses of how communities allocate federal funds for the disadvantaged were made: (1) by budget line item, and (2) by the types of programs funded.

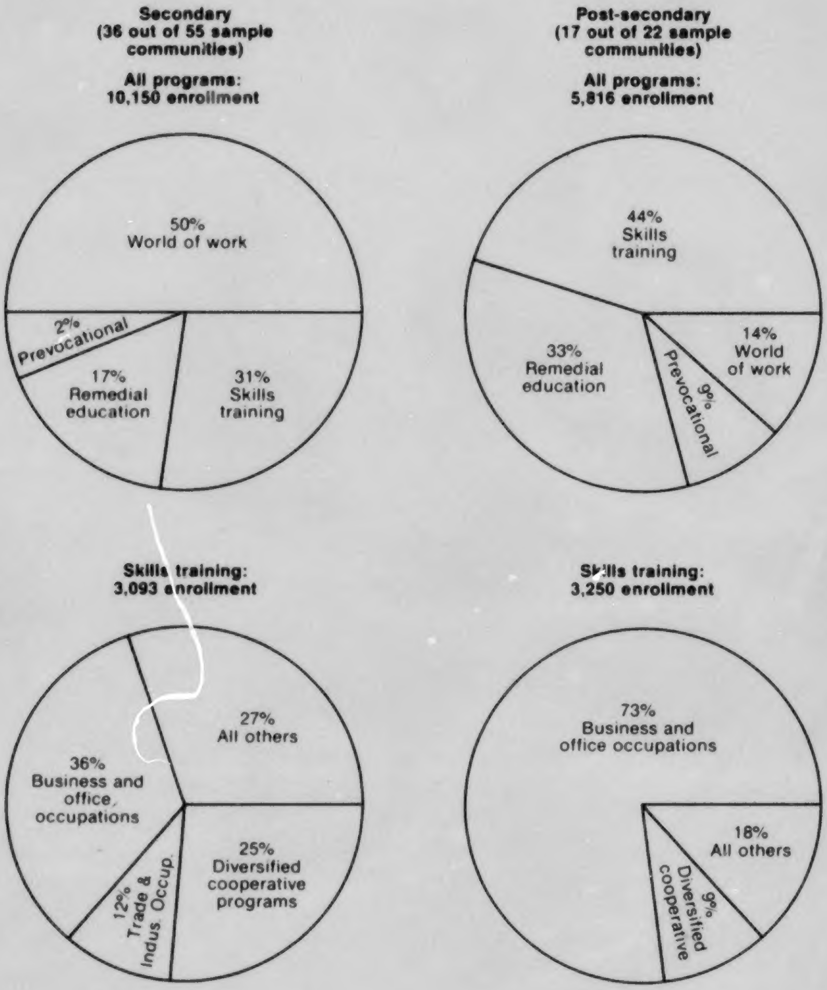
*Budget line items.* The vast majority of Part B set-aside and Section 102(b) funds were used to hire staff who work directly with students identified as disadvantaged. Only a small portion of the funds were used to hire administrative and other noncontact personnel. Thus, it can be concluded that most Part B set-aside and Section 102(b) funds were being used to provide direct services to students.

*Type of program.* The types of programs funded were divided into the following categories: (1) skills training (or training in either specific or general occupational areas), and (2) nonskills training (or prevocational training, remedial education, and world-of-work programs that are not integrated with skills training either in the classroom or on the job). The attempt was also made to identify the occupational areas in which skills training was offered.

Sixty-nine percent of the high school students and 56 percent of post-secondary-level students were *not* enrolled in skills training programs (see Figure 1). Thus, it would appear that the majority of Part B set-aside and Section 102(b) funds was being used for the initiation of prevocational, remedial, and world-of-work programs. This was especially true at the secondary level, where more than half of the students were enrolled in world-of-work and prevocational programs. If it can be assumed that remedial programs were integrated with skills programs, skills training was extremely narrow at both levels. The vast majority of high school students was enrolled in three occupational areas (business and office, trade and industrial, and diversified co-op), while only one occupational area (business and office) accounted for most of the students enrolled in post-secondary skills training programs.

## FIGURE 1

Allocation of Resources by Type of Program for School Year 1974-75
Secondary and Post-secondary



**Secondary (36 out of 55 sample communities)**

**All programs: 10,150 enrollment**

**Post-secondary (17 out of 22 sample communities)**

**All programs: 5,816 enrollment**

**Skills training: 3,093 enrollment**

**Skills training: 3,250 enrollment**

NOTE: Does not include one prevocational secondary program in Philadelphia which enrolled 19,000 students.

## Policy and Administration

Although overall policy was imposed on the schools by the Vocational Education Act amendments of 1968, the congressional mandate was sufficiently broad to allow considerable flexibility at the state and local levels. In designing and conducting this assessment, we made the assumption that issues relating to the provision of vocational education for the disadvantaged were considered at the national, state, and local levels, and that a considerable body of policy formulations would be available to researchers. The fact is, however, that the only comprehensive policy statement obtained was the *Suggested Utilization of Resources and Guide for Expenditures (SURGE)*, issued by the U.S. Department of Health, Education and Welfare. Carefully formulated formal policy statements were absent at both state and local levels regarding mainstreaming, work education, the use of Part B set-aside versus Section 102(b) funds, coordination with other agencies, the use of advisory councils, and state earmarking and community matching of funds. Evidence from interviews with 77 members of boards of education and boards of regents indicated that boards rarely initiated policy with regard to either vocational education in general or vocational education for the disadvantaged in particular.

*State funding methods.* Most states (16 out of 23) required local education jurisdictions or schools to submit proposals to the state, according to established guidelines, and funded projects on the basis of the quality of the proposals and the ability of the sponsors to carry out the projects (project-by-project basis). The remainder was funded on a block grant basis, i.e., to local education jurisdictions. States which funded on a project-by-project basis had more administrative control over their programs. The fact that sponsors were required to submit proposals which set down in writing the general and specific goals of projects, the characteristics of the students to be served, the educational techniques to be employed, and line item budgets (including local funds, if any, to be contributed) implied a certain amount of planning and facilitated both pre- and post-program evaluation.

*Planning.* State plans gave overall statewide estimations of the disadvantaged populations within states, but state program officers appeared to be unacquainted with these figures, nor were they able to identify the sources of the statistics. It seemed, therefore, that state plans were drafted by persons or divisions other than the program officers or special needs divisions, and were considered to be little more than exercises in grantsmanship. The guidelines for state plans specify that goals or programs are to be clearly stated. Despite this requirement, in most instances the objectives were couched in broad terms, such as "to provide the disadvantaged students of the state with necessary vocational education." This type of objective lends itself neither to concrete planning nor to evaluation.

It would be a mistake to say that no planning took place at the local level, but it is accurate to maintain that what planning did take place was of a short-term nature, generally directed at justifying specific projects. When asked about the universe of need or the establishment of priorities, most respondents expressed bewilderment. "Planning," if it can be called that, consisted mainly of the design of projects on an ad hoc basis; the objective was to spend the Part B set-aside and Section 102(b) funds available from the state.

*Monitoring and evaluation.* Considering the informality of the planning process, it should come as no surprise that the monitoring and evaluation of programs for the disadvantaged was equally informal at both the state and local levels. State- and community-level reporting requirements were minimal, and management information systems were extremely weak at both levels. Where states funded on a project-by-project basis, the opportunity for monitoring and evaluation was at least present. However, in most states only one administrator was assigned the responsibility for disadvantaged programming which meant that comprehensive monitoring and evaluation was not possible. In states where state education agencies were subdivided into regions, program monitoring and evaluation appeared to be more complete, and program officers appeared more knowledgeable about programs for the disadvantaged than in states which were not divided into regions.

### Constraints and Opportunities

The major constraints mentioned by respondents at all levels were:

(1) Lack of funds
(2) Lack of facilities
(3) Unwillingness of some instructional personnel to accept disadvantaged students into their classes
(4) Negative image of vocational education
(5) Ambiguity of the term "disadvantaged student"

Respondent recommendations at the state, community, and project levels included the following:

(1) Local school districts should not be required to match funds for vocational education programs for the disadvantaged; federal funding should be on a two-year basis; and "seed money" funding should be discontinued.
(2) In-service training should be provided by the states for instructional personnel, and instructors should be evaluated on how well they work with disadvantaged students; continued employment should be at least partially based on these evaluations.
(3) The federal government should define more precisely the meaning of the term "disadvantaged," and states should establish priorities and see that they are observed by local education jurisdictions.
(4) More funds should be allocated for planning, administration, and evaluation.

## THE PROGRAM

The material that follows is a synthesis of findings and conclusions regarding on-site visits to 84 vocational education projects for the disadvantaged in 23 states. A project was defined as a Part B set-aside or Section 102(b) grant to a school or local education jurisdiction for the purpose of providing *specific educational services* to the disadvantaged. Block grants to local education jurisdictions for nonspecified services were *not* considered projects. Projects broke down into two categories:

(1) *Regular:* Disadvantaged students were placed in regular vocational education programs with nondisadvantaged students.
(2) *Special:* Disadvantaged students were placed in separate vocational education classes, either on a full- or part-time basis.

The material presented in this section is organized as follows: (1) statistical overview of the project sample, (2) project administration, and (3) project outcomes.

### Statistical Overview

*Mainstreaming.* Two out of every three students enrolled in the projects (both secondary and post-secondary) were in *regular* classes, thus indicating that mainstreaming is considered appropriate and feasible for many disadvantaged students.

*Enrollee characteristics.* Approximately 46 percent of the enrollment in high school projects was minority; characteristics information by race and ethnic background was not available for 51 percent of the post-secondary enrollment. Of the known post-secondary-level enrollment, 22 percent were minority and 27 percent white.

Women comprised a slightly higher percentage of the total high school enrollment than men; the opposite was true at the post-secondary level. However, characteristics by sex were unavailable for 34 percent of the post-secondary enrollment. Most of the high school students were between sixteen and seventeen years of age, and in the tenth and eleventh grades; but, here again, the unknowns were 62 percent (age) and 36 percent (grade). Age and grade information were unavailable for 63 percent and 36 percent respectively of the post-secondary enrollment.

*Type of education.* Of the 62 high school projects, 29 (or 47 percent) had work education components. These projects accounted for 49 percent of the total enrollment in the 62 projects. Only two of the 22 post-secondary level projects, accounting for 4 percent of the enrollment, had work education components. However, because of the small size of the post-secondary level subsample, these figures are not significant.

### Project Administration

*Allocation of resources.* Findings regarding the allocation of resources for 64 of the 84 sample projects supported the community-level findings. At the high school level, 82 percent of the 1974-75 expenditures were for direct services to students; the corresponding figure at the post-secondary level was 74 percent. Federal funds constituted 72 percent of all high school expenditures and 56 percent of all post-secondary-level expenditures.

*Administrative techniques.* The fact that half of the project directors interviewed did not believe that the students enrolled in Part B set-aside and Section 102(b) programs for the disadvantaged *were* disadvantaged raised serious questions about the administration of the entire program. With respect to the administration of projects at the school level, there was a lack of criteria for identifying disadvantaged students, and a corresponding lack of adequate assessment procedures for determining the conditions which cause school failure. These two factors may account for the anomaly described above. If there is no definition of "disadvantaged," no criteria through which disadvantaged individuals can be identified, and no assessment procedures through which it can be determined whether students meet established criteria, the term "disadvantaged" becomes meaningless. Part of the problem may be due to a reluctance on the part of counselors and other school personnel to "label" students, but regardless of the cause, unless a target population is in some way identified, the program itself becomes meaningless — a program without objectives.

### The Instructional Program

The findings regarding types of programs in which disadvantaged students were enrolled are as follows:

(1) Students in the sample projects were enrolled in more nonskills training than skills training programs. Nearly half of the secondary enrollment (47 percent) were in world-of-work projects; 47 percent of the post-secondary-level students were enrolled in remedial programs. It should be pointed out that students enrolled in remedial projects may also be enrolled in skills training courses not funded out of Part B set-aside or Section 102(b) funds. In such cases, disadvantaged funds were being used to support students enrolled in regular programs.

(2) Almost half of the high school students were enrolled in work experience programs, indicating that it was not difficult to place disadvantaged students in work situations. However, the vast majority of students enrolled in work experience projects (86 percent) were not receiving skills training in school, bringing into question the quality of work experience projects funded for the disadvantaged (see "work education" section which follows).

(3) At both the secondary and post-

secondary levels, the majority of students enrolled in skill training programs was not receiving instruction in specific occupational areas.

*Occupational offerings.* As was discovered at the community level, training for the disadvantaged seems to be concentrated in one occupational area: business and office occupations. More than half of the high school enrollment (55 percent) and virtually all the post-secondary enrollment (95 percent) were in this area. Because of the small size of the post-secondary sample, these figures were not significant, but data regarding the high school projects lead to the overall conclusion that the range of occupational areas for disadvantaged students is extremely narrow.

*Curriculum and teaching methods.* The curriculum in use and the teaching methods employed were for the most part traditional. The one ingredient that seemed to be added was individual attention. The instructors developed their own curriculums, using material developed by states, universities, local education agencies, and other sources. Individualized instruction, based primarily on the development of program modules and the use of workbooks, was common; excellent use was frequently made of audiovisual equipment in remedial programs. There were a few unique programs which featured the use of hands-on training, but the majority of high school students were enrolled in world-of-work programs; and most post-secondary level students were enrolled in remedial programs. Thus, the development of curriculums was primarily in those two areas.

*Facilities and equipment.* More than half of the project directors (57 percent) rated the equipment "excellent"; 29 percent said that it was "adequate"; and 11 percent rated it "inadequate." It should be emphasized, however, that world-of-work instructors, whose equipment needs were minimal, were included among those who rated equipment. Most of the adequate and inadequate ratings came from the project directors of skills training programs. The most frequently mentioned need (by those who rated equipment as less than excellent) was material for individualized instruction. Other reasons for less than excellent ratings were: equipment out of date, equipment in poor repair, lack of visual aids, lack of tools, and materials too sophisticated for disadvantaged students.

*Work education.* Although nearly half of the high school students enrolled in the sample projects were in work experience programs, the quality of the programs appeared to be questionable. For example:

(1) Agreements between schools and employers generally were not written, or signed, by the two parties. "Training plans" were virtually nonexistent.

(2) Almost 70 percent of the students interviewed rated their classwork as "somewhat" (41 percent) or "not at all" (27 percent) related to their on-the-job training.

(3) Male students were receiving an average wage rate of $2.36 an hour; in comparison, the wage rate for female students was $2.20 an hour.

(4) According to the 442 work experience students interviewed, the tasks they were performing on-the-job were in low-skill, low-pay, and high-turnover occupations. For example, 78 percent of the tasks listed in the food services category were waitress, food handlers, busboys, and dishwashers; 44 percent of the tasks listed under car maintenance were service station attendant, wash cars, and park cars; 67 percent of the jobs listed under office work were general office work, filing, running errands, and so forth; 80 percent of the jobs listed under child and hospital care were to take care of patients (give baths, and so on), and child care (baby sitting); and one-third of the jobs listed under construction were general construction

work (laboring), load trucks, and run errands.

(5) *Sex stereotyping:* Besides being paid 26 cents an hour less than men, eight out of ten women enrolled in work experience programs were assigned to jobs in the following categories: food service, child and hospital care, and cashier. No women were employed in car maintenance and repair; and of the 136 jobs listed under the construction category, only 25 were listed by women — sixteen of which were light maintenance work and five "run errands."

There can be no doubt that work experience programs were being funded for the disadvantaged, but there was some question as to their quality. Most of the students were being placed in low-skill, low-paying jobs, which they could probably apply for and obtain without first receiving vocational training and which provided little bona fide on-the-job training. The serious question that arises is: are Part B set-aside and Section 102(b) funds being used to create a new lower track for disadvantaged students, just the opposite of what the act intended?

### Project Outcomes

Whatever the deficiencies of program administration, there can be no doubt that the available outcomes data indicated that the Part B set-aside and Section 102(b) program for the disadvantaged was operating on a successful basis. For example:

(1) Program costs at $395 per enrollee (federal costs) and $401 per enrollee (combined federal, state, and local) were low.

(2) The average completion rate (83 percent) was high.

(3) Student ratings of the programs were overwhelmingly favorable.

(4) Employer ratings of the programs and their student employees were also overwhelmingly favorable.

These data would be a good deal more significant, however, if it could be ascertained that the intended target population was well defined, let alone well served, and that the programs were designed to overcome conditions — determined by means of individual assessment — that cause school failure. With regard to the employer interviews, if it was true that the schools — through work education programs — were acting as referral agencies for employers in the secondary labor market (employers of low-wage, low-skill workers in high-turnover jobs), employer enthusiasm for the program would be expected.

## RECOMMENDATIONS

### Summary and Conclusions

The conclusions of the study can be best summarized by commenting on six congressional assumptions upon which the disadvantaged provisions of the 1968 amendments were based. The assumptions will be stated first, and the comments will follow.

(1) *Need for disadvantaged Part B set-aside:* Prior to 1968, many disadvantaged students either were not enrolled in vocational education programs or, if they were enrolled, were not being provided with the kinds of services they needed to succeed. *Comments:* While vocational educators did not disagree with the above assumption, they contended that vocational education has always been considered a referral grounds for academic rejects, and that prior to 1968, the program was underfunded, underequipped, and received little consideration from policy makers at any level. They also resented the implied criticism that vocational education is "elitist" and, that when the disadvantaged became a national priority, the major burden for solving the educational problems of the disadvantaged was delegated to vocational education. This factor, more than any other, may account for the less than enthusiastic administration of the program.

(2) *Meaning of "disadvantaged":* There is a common understanding of the characteristics of disadvantaged stu-

dents (for identification purposes), or a common understanding of the *meaning* of disadvantaged. *Comments:* The term "disadvantaged" was interpreted in its broadest sense and varied widely from state to state, community to community, and school to school. There was no common meaning of the term and no common understanding of the characteristics of disadvantaged students. As a result, the Part B set-aside provision for the disadvantaged appeared to be a program in search of a target group.

(3) *Assessment:* Assessment techniques exist or can be developed whereby the conditions which result in school failure can be identified on an individual basis. *Comments:* Assessment techniques may exist or may have been developed, but, if so, they were not being used to identify disadvantaged students, or to discover individual conditions which cause school failure. The informal assessment process was directed toward justifying the disadvantaged status of students enrolled in Part B set-aside and Section 102(b) programs, rather than toward the identification of conditions which result in school failure.

(4) *Education treatments:* Educational treatments exist or can be developed which can be applied to students suffering from conditions which cause school failure. *Comments:* Without individualized assessments of students screened into the program, it was not surprising that "educational treatments," if they can be called that, were so broad that they were virtually unidentifiable. The one individual treatment that prevailed was "individual attention."

(5) *Planning:* A body of data exists or can be developed which facilitates state and local planning for the disadvantaged, the establishment of priorities, and the allocation of funds to local education jurisdictions on a rational basis. *Comments:* Without clear definitions of the term "disadvantaged," and the application of individual assessment techniques, planning — except in a general sense — was all but impossible. Planning was generally done on an ad hoc basis; that is, the money was there to be spent, and projects had to be designed to justify the expenditures.

(6) *Programming:* There is a common understanding of the kinds of programs that should be funded for the disadvantaged (e.g., solely occupational skills training, or a variety of services, including remedial education, counseling, prevocational training, world-of-work instruction, work education, and so forth). *Comments:* The types of occupational training programs in which disadvantaged students were being enrolled were few in number and of questionable value. Half of all high school students were enrolled in world-of-work or low-quality work experience programs; few were enrolled in skills training programs — innovative or non-innovative. At the post-secondary level, most students were enrolled in remedial education programs; presumably, they were also enrolled in skills training programs not supported by Part B set-aside or Section 102(b) funds.

## Recommendations

The 1976 amendments to the Vocational Education Act of 1963 not only continue the disadvantaged set-asides, but under Part B of the act, increase the percentage of the funds set aside for the disadvantaged from 15 to 20 percent. The new act, however, requires that the 20 percent set-aside be used to finance *50 percent* of the costs of providing vocational training and services to the disadvantaged; in other words, states and local communities must now not only match total Part B grants, but also the portion of those grants which are used to fund programs for the disadvantaged. Finally, the 1976 amendments require that the states perform more comprehensive monitoring and evaluation of vocational education programs. With these factors in mind, we believe that consideration must be given to the following recommendations.

1. *Definition of disadvantaged.* The target group for the Part B set-aside and Section 102(b) program must be defined more precisely. It is possible that the term "disadvantaged" should be discontinued, since it has negative connotations to vocational educators, and its meaning is unclear. Whether or not the term is discontinued, program priority must be given to socioeconomically deprived groups or target areas whose members or residents are most likely to be in need of the special programs or services made possible by the 1968 act.

2. *Student assessment.* At the same time, the identification of students from these target areas or groups, on an individual basis, must not only be continued but strengthened. The intent of the act regarding "individual identification" must be made clear to state and local administrators, and guidelines for the performance of individual assessments must be made more explicit.

3. *Organization.* Each state must have at least one person whose sole responsibility is to plan and carry out programming for the disadvantaged. Where two or more persons have these state responsibilities, one should be assigned as coordinator.

4. *Planning.* The person with responsibilities for planning programs for the disadvantaged must be given adequate support to set up these statewide programs. To accomplish this, the "problem officer" must work with people who represent special education, migrant workers, the American Indian, compensatory education, adult basic education, and dropout prevention divisions (or programs), and research and statistics, and with community program officers in order to determine needs and establish priorities.

5. *Funding.* It should be required that projects be funded on the basis of written proposals. Clear and specific guidelines based on the federal guidelines, but adapted to state needs, must be provided to local educational jurisdictions. It is strongly suggested that allocation of funds be based on proposals which are within priorities established at the state level ("4" above).

6. *Proposals.* Proposals from schools or local education jurisdictions must be reviewed carefully to see that the guidelines have been followed, that every student involved can be identified, that there is a description of the special services required to help the student succeed, and that evaluation is built into the proposed programs.

7. *Evaluation.* An on-site evaluation of at least 33 percent of the programs funded in whole or in part with Part B set-aside or Section 102(b) funds for the disadvantaged must be made annually. Personnel from other state vocational education divisions should be involved as often as possible.

8. *Review of proposals.* The following should be involved in the review of proposals submitted by local educational jurisdictions or schools:

   (a) State vocational education personnel from the occupational service areas.

   (b) Persons involved in planning, education, and training of the target population under other programs, including special education, ESEA Title 1, bilingual, migrant, and CETA.

9. *Establishment of priorities.* To the greatest extent possible, all other parts of the Vocational Education Act amendments of 1976 should be tied together in the planning of a comprehensive program for the disadvantaged, and procedures should be developed to ensure that:

   (a) The state plan is followed.

   (b) Areas of economic depression, high youth unemployment and high school dropouts are given priority attention.

10. *Pre- and in-service training.* States must provide for in-service training

of staff, either directly or by contract. Teacher training institutions must be involved in this effort. Curriculum changes in pre-service teacher education programs enabling potential vocational education staff to be better prepared for working with the disadvantaged should be instituted.

11. *Advisory councils.* State advisory council members representing the disadvantaged must be continuously consulted and advised by *program officers in charge of programming for the disadvantaged* through a formal mechanism.

12. *Section 102(b) funds.* It should be required that Section 102(b) funds be used only in areas where it is financially not feasible for local educational jurisdictions to match state funds, or for experimental and demonstration projects in correctional institutions, areas of economic depression, or areas of high youth unemployment and excessive school dropouts.

13. *Programs.* A review must be made of the types of programs funded for the disadvantaged to determine whether adequate skills training is available for disadvantaged students, and the appropriateness of world-of-work and remedial education programs funded for the disadvantaged.

14. *Work education.* States must develop policies and standards with regard to work experience programs for the disadvantaged. Great care should be taken to make certain that disadvantaged students are not being referred into the secondary labor market (low-pay, low-skill, high-turnover jobs), and that the training they receive on the job is legitimate vocational training. Administrators at all levels must be aware of the danger of creating inferior (or lower track) programs for the disadvantaged students.

15. *Coordination with other agencies.* Administrators at the community level should be required to coordinate their programs for the disadvantaged with other agencies (school and non-school) which provide services to the target population. States should require that proposals from local education jurisdictions indicate efforts that have been made in this direction.

16. *Management information system.* It should be required that local educational jurisdiction proposals contain specific measurable objectives, as well as an adequate description of the evaluation processes to be used, and management information systems at both the local and state levels should be installed — based on these objectives and evaluation processes.

# An Assessment of Vocational Education Programs for the Handicapped under the 1968 Amendments to the Vocational Education Act: A Summary

JOHN WALSH
Olympus Research
Corporation

Society's approach to the handicapped — to those who because of physical, mental, or emotional disabilities do not meet some individuals' idea of "normal" — has almost always been ambivalent. The reaction of the non-handicapped to the handicapped is often one of discomfort — and sometimes of manifest revulsion. Employers and their employees often shun the handicapped because of the way they "look" or because they assume that the handicapped are not as competent — at any job — as the non-handicapped. Partly as a result of these all-too-common attitudes, the handicapped have been segregated, or have segregated themselves, and until recent years efforts to bring them into the mainstream of society have been both rare and without widespread success.

Many of the difficulties faced by the handicapped are less the result of their handicapping conditions than of society's perception of such conditions. The designation "handicapped" not only sets individuals apart from the rest of the population but also carries a strong negative connotation of incompleteness or incompetence. Attempts to classify the handicapped into such categories as "educable mentally retarded," "speech impaired," "hard of hearing," and "blind" are often arbitrary in their failure to account for individual differences and are sometimes inaccurate or misleading.

These problems are compounded in the educational and employment arenas. Traditionally, there has been little emphasis in vocational education on programming for the handicapped. Handicapped students who could not compete on an equal basis with the non-handicapped had to look outside the regular vocational education establishment for rare opportunities available to them in sheltered workshops, private training programs, or institutions for the handicapped. Even rarer were training opportunities that prepared the handicapped to compete in the open labor market with the non-handicapped. There was little access to the normal world of work for that door was closed.

In the early 1960s, spokesmen for the handicapped began to impress this waste of human potential on the public mind, and in 1963 Congress passed the Vocational Education Act which charged the states with the responsibility of providing vocational programming for the handicapped. After four years had passed, however, this general legislative charge had produced few new opportunities for handicapped individuals. Thus in the amendments to the Act in 1968, Congress required that 10 percent of each state's basic grant for vocational education (Part B of the amendments) be used exclusively to finance programs "for handicapped persons who because of their handicapping condition cannot succeed in the regular vocational education program without special educational assistance or who require a modified educational

---

JOHN WALSH is with the Olympus Research Corporation, Salt Lake City, Utah.

program." The amendments defined the term "handicapped" as "persons who are mentally retarded, hard of hearing, speech impaired, visually handicapped, seriously emotionally disturbed, crippled or other health impaired persons who by reason thereof requre special educational and related services."

The amendments have now been in operation for four years in most states, but as of June 1973, little was known of the strategies adopted by the states for allocating funds under the amendments, state planning for the set-aside program, methods of selecting local programs for support, and the extent of support provided by sources other than vocational education. Consequently, in June 1973, the U.S. Office of Education entered into a contract with Olympus Research Corporation (ORC) to perform an assessment of the Part B set-aside program for the handicapped. The overall purposes of the study were as follows:

(1) To provide programmatically useful information on the relationships between post-program performance and the kinds of experiences that handicapped students receive in various vocational education programs

(2) To identify and analyze existing constraints or limitations in carrying out the various vocational education programs for handicapped students, including constraints internal to the program and those external to the program

(3) To determine the feasibility of expanding a work experience component in vocational programs for the handicapped and the conditions under which expansion is possible

(4) To examine the strategies used by states in identifying handicapped students and their need for services, and the selection of projects for funding

(5) To determine to the extent possible the degree to which funds from the 10 percent set-aside under Part B for handicapped students actually reach handicapped students rather than become indistinguishable from other vocational education funds

ORC designed a three-part approach for carrying out the objectives of the study: (1) an assessment of program administration at the state level, (2) a project level assessment of vocational education programs for the handicapped, and (3) case study interviews with students, parents, and employers.

Visits were made to 25 states, selected randomly with a probability proportionate to total enrollments in the fifty states. Directors of vocational education and special education, program officers, and research and statistical personnel were interviewed at the state level.

A total of 92 projects was visited in conjunction with the project level assessment. The projects were divided into two subsamples: (1) 74 projects in 19 states which were representative of all projects in those states and (2) a purposive sample of 18 projects in three rural states and California. To the extent possible, data collection forms (which included enrollment, fiscal, occupational offerings, and outcomes information) were filled out for each project, and interviews were conducted with project directors, school principals, counselors, instructors, and local education agencies' special education officers at each site.

A total of 1,001 student and parent interviews was conducted in five of the sample states, 681 with students currently enrolled and 320 with students who had completed projects during the 1972-73 school year. The number of employers interviewed totaled 165; of these, 94 were participating in the projects and 74 were *not* participating. All interviews were conducted by Decision Making Information (DMI) under subcontract to ORC.

Through an analysis of the information emanating from these three separate but interrelated parts of the overall study, the attempt to fulfill the objectives of the study was carried out.

## SUMMARY OF FINDINGS

It should be emphasized that the study conducted by ORC-DMI was an *assessment*, not an *evaluation* of the Part B set-aside program. The program was not measured against a set of criteria of what constitutes a "good" program. Rather, the attempt was made to determine how states, local education agencies and schools are coping with the Part B set-aside, both from an administrative and program point of view. The analysis which follows is organized along the lines of the approach taken by ORC; that is, summaries of the major findings of the state and project level assessments, and of the student, parent, and employer interviews. Subsequent sections of the executive summary contain ORC's overall conclusions and recommendations.

Although some of the findings may appear to be negative, it should be kept in mind that the most important finding of the study is that Part B set-aside funding has resulted in vocational education projects for the handicapped that would never had occurred had there been no such legislation and that most of the set-aside funds were being used to provide direct services for the handicapped. Many of the program weaknesses identified in the state and project level assessments were administrative in nature and may be partly due to inexperience on the part of vocational education administrators who have never before been given the responsibility of providing educational services for handicapped individuals. One conclusion is inescapable: If vocational educators were to correct some of the major administrative weaknesses — weaknesses which may not be their sole responsibility — funds now being spent to provide direct services for the handicapped would be siphoned off for administrative purposes. This "tradeoff" should be kept in mind when reading the remainder of the summary.

## THE STATE LEVEL ASSESSMENT

The state level assessment was conducted in 25 states. It included analyses of the adequacy of state level management information systems, state administration of the set-aside program, and an operational profile of how states plan for, fund, monitor, and evaluate the Part B set-aside program for the handicapped. The review of statewide management information systems was not limited to the 25 sample states. Data reported by all fifty states to the U.S. Office of Education were reviewed (see below).

### Management Information Systems

Each year, the states are required to report a wide range of data on set-aside programs to the Office of Education (e.g. program costs, enrollments, and completions). Because of this requirement, it was anticipated that such data would be readily available at the state level. However, this did not prove to be the case. It was decided therefore that we examine the data reported by the fifty states to the Office of Education to determine whether it would be more complete than information collected by research teams at the state level. It was found that most of the national data were either incomplete or inaccurate. The two subset paragraphs below are an example.

*Completer information.* The number of completers reported ranged from 4,392 in Florida to none in New York, California, and Ohio. Michigan reported eight completers, Oklahoma 2,240. In Minnesota, 73 percent of the program enrollees completed; the corresponding figure for Texas was only 4 percent. Clearly the states were not in agreement on how to satisfy this particular reporting requirement. Some had no figures at all to report.

Others apparently reported scattered completer figures from some but not all of the projects within their states. There were several reasons for the erratic nature of this information. Perhaps the most important was that many states did not require schools to report on completers. The second was that even in those states which required schools to report on completers, there was no common definition of the term "completer." In some states, for example, students were not considered completers until they entered the labor force, or did not reenroll in school (either in the "project" or in other classes). In other states, the sole criterion for completer was that the student remain in school for one year. Regardless of the reasons, national data on handicapped completers was not useful for program monitoring purposes or for making comparisons between states.

*Average costs.* According to data reported by the states to the Office of Education, average costs per handicapped student ranged from a high of $1,664 to a low of $44. This wide range of per-student costs raised the question as to what the states included in the "total expenditures for the handicapped" category. For example, did they include only those funds that represented expenditures over and above the basic expenditures made for all students, or did they include all expenditures made for handicapped students? It may be that varying interpretations of what is asked for in this category were in part responsible for the wide range of costs per enrollee.

Other data dealing solely with expenditures and enrollments appeared to be more accurate and revealed some interesting insights regarding vocational education programs for the handicapped. For example, a comparison of total state expenditures for the handicapped with expenditures under the Part B set-aside program showed that without the Part B set-aside, there would be few vocational education opportunities for the handicapped. In 17 states, there were virtually no differences between total expenditures for the handicapped and expenditures under the set-aside program. In all but a few states, the differences were not significant.

Comparisons between percentages of total enrollments that were handicapped and percentages of all funds expended for the handicapped indicate that in most states the costs for educating handicapped students were higher than the costs for educating the non-handicapped; that is, percentages of funds spent for the handicapped were higher than percentages of total enrollments that were handicapped. Thus in 38 states it appeared that total per-student expenditures for the handicapped were higher than per-student expenditures for regular students. However, in 12 states, per-student expenditures for the handicapped appeared to be either the same as or lower than those for regular students.

Finally, in 35 states expenditures for the handicapped during fiscal year 1973 equaled 10 percent or more of total expenditures. This does not necessarily mean that the 15 states whose expenditures were less than 10 percent were not in conformity with the law. Fiscal year expenditure data include not only allotments but also carryover funds from the previous fiscal year. Thus, it was impossible to determine whether the fifteen states whose handicapped expenditures were less than 10 percent were or were not in conformity with the law.

The major conclusion drawn from the examination of national data, and from attempts to collect fiscal and program data at both the state and local levels, was that complete and accurate fiscal and program information — information necessary for the proper monitoring and evaluation of individual projects, statewide programs, and the overall national program — was not available at any level.

## Organizational Profile

All material relating to the organizational operational profiles which follow are based solely on assessment performed in the 25 sample states. Aside from the specific fiscal set-aside, the 1968 amendments detail organizational, operating, and reporting requirements that apply to Part B funds in general but are nevertheless specifically relevant to programming for the handicapped. One of these requirements is the establishment of a state advisory council, which must include a member knowledgeable in the special education needs of the handicapped and which must evaluate the programs funded under the amendments. Another is that state divisions of vocational education enter into cooperative agreements with other agencies in the administration of vocational education programs. State planning, funding procedures, and monitoring and evaluation are discussed in "Operational Profile" which follows this section. The "Organization Profile" section deals with the structures devised by states for the administration of the set-aside program, the use of advisory councils, and interagency cooperation.

*State structures.* One "program officer" was responsible for handicapped programming in all but one of the 25 sample states. The single exception was a geographically large rural state in which the director of vocational education assumed responsibility for handicapped programming. Program officers operated at the third organizational level; that is, their superiors reported directly to directors of vocational education. They were located in "Special Needs Divisions" (the names of these divisions varied from state to state) which also had responsibility for the disadvantaged. Although the use of only one individual to carry out all administrative functions under the set-aside program resulted in low administrative costs — a characteristic of this program — it also explained why state level planning, monitoring, and evaluation regarding programming for the handicapped were at best sketchy and at worst nonexistent.

*Advisory councils.* In theory, state advisory councils are supposed to assist directors of vocational education in initiating programs for the handicapped. The amendments charge such councils with planning and evaluation responsibilities and also require them to have one or more representatives "experienced in the education and training of handicapped persons." All program officers interviewed were aware of their state councils and of the council liaison officers within their state agencies, and several could identify the handicapped specialists on the councils. However, although not one of the respondents complained of the ineffectiveness of the councils, none cited examples of council activity in any phase of the set-aside program. Apparently there was virtually no concrete assistance provided by the councils, and none seemed to be expected by the program officers.

*Relationships with other agencies.* The state level assessment indicated that although cooperative relationships existed between divisions of vocational education and divisions of special education — and in a few states, departments of vocational rehabilitation — in most states even these were relatively nonproductive, and for all practical purposes, relationships with other agencies were nonexistent.

In Minnesota, a coordinator was jointly funded by vocational education and special education. The sole responsibility of the person occupying this position was to coordinate the activities of the two agencies in vocational programming for the handicapped. In eight other states, persons occupying other positions (either in vocational education or special education) were assigned the coordinating responsibility. In still another 12 states, the only relationship that existed between the two agencies was that special education was given the opportunity to review all proposals for vocational education projects for the handicapped. In the remaining four states, there were no formal relationships between the two agencies.

Formal relationships existed with departments of vocational rehabilitation in 14 states. However, only seven of these agreements actually resulted in the provision of services by vocational rehabilitation to students enrolled on the Part B set-aside program. Among the services provided by vocational rehabilitation in these seven states were: placement, counseling, student evaluation, planning assistance, purchase of services not otherwise available, and occasional joint funding of projects. Agreements with vocational rehabilitation were nonexistent in 11 states.

There appeared to be a lack of agreement among state program officers as to whether vocational rehabilitation can legitimately provide supportive and additional services to secondary level handicapped vocational education students. The most common explanation for the lack of direct involvement by vocational rehabilitation was that its client population is of an older age group. However, the fact that in at least seven states vocational rehabilitation did provide services to students in the set-aside program indicates that similar agreements could be reached in other states.

Only four states reported agreements with the employment service, and of these, only two produced a significant amount of activity. Agreements with other agencies were so few as to be insignificant.

### Operational Profile

The assessment of state level operation of the set-aside program included the identification of techniques employed to discover the "universe of need," to plan vocational programming for the handicapped, techniques for funding local education agencies or individual schools, and techniques for monitoring and evaluating funded projects.

*Universe of need.* Although states go through the motions of drafting state plans, including plans for the handicapped, all respondents interviewed were vague as to whether attempts were made to identify the number of handicapped individuals who could benefit from vocational education, or breakdowns of handicapped students by handicapping condition. The general consensus was that these are *local* responsibilities. However, based on the kinds of information required by states in project proposals and on state reporting requirements, it appeared that state vocational education administrators did not consider the gathering of universe of need information a major priority (this subject is discussed in more detail in the paragraphs describing the project level assessment).

*Planning.* Planning was also considered a local responsibility. Planning at the state level was limited to the review of project proposals and decisions as to which proposals would be funded, generally on the basis of the sizes of school districts and other formulas. Factors which mitigated against planning at the state level were the independence of the local education agencies and the fact that only one person was assigned to the administration of the set-aside program.

*Funding procedures.* Twenty-two of the 25 sample states funded "projects"; that is, specific programs for the handicapped submitted in proposal form to the states by local education agencies and individual schools. Two states, California and Georgia, provided block grants to local education agenices on a formula basis. One state (Illinois) reimbursed schools for each credit hour handicapped individuals were enrolled in vocational education programs.

Proponents of the block grant method of funding emphasized that such a procedure resulted in maximum flexibility to local education agencies, that is, these agencies were not "locked" into specific projects but could apply the funds throughout the school year where they were most needed. There were, however, two weaknesses to the block grant method: (1) states had little control over the programs instituted by local education agencies and (2) the allocations of set-aside funds to some local education agencies were so small as to be insignificant. The former appeared to be the most serious drawback to the block grant method. Fiscal and program information regarding current programs was virtually nonexistent in states which allocated set-aside funds on a block grant basis to local education agencies. The major reason for this was that local education agencies used a *post facto* auditing procedure for accounting for set-aside funds; that is, the funds were not applied to service categories until after the completion of the fiscal or school year. State monitoring and evaluation of set-aside programs were virtually impossible under this system. With regard to the second drawback, many local education agencies whose allocations were small turned the funds back to the states. Special projects were then funded with the unused allocations.

States that funded projects had far better control over their programs than those that did not. Program officers could account for services purchased with set-aside funds and the number of handicapped persons enrolled in the projects. In those states with comprehensive reporting requirements (a small minority), it was possible to account for dropouts, completions, and placements (more on this subject below). The question appeared to be whether "control" should be sacrificed for local education agency "flexibility." The state level assessment indicated that the "project" method need not result in a lack of flexibility. Project proposals could be modified, often without an excess of paper work, thus assuring some local flexibility. More importantly, there was a certain amount of planning built into the project method. The purposes of projects were spelled out, justifications for the types of projects proposed and the types of handicapped students to be served were contained in project proposals, and the methods which the purposes were to be realized were summarized. These, together with line item budgets, made monitoring and evaluation *possible*, albeit weak, in most states.

Several states used set-aside funds as "seed money"; that is, projects were funded only if local education agencies or schools agreed to gradually increase local financing of the projects so that eventually the projects would be 100 percent locally funded. One state required assurance that projects would be locally funded during the second year of operation; most required a gradual reduction of federal funds over a three- to five-year-period. A follow-up study should be carried out to determine how the seed money concept is working in practice.

*Monitoring and evaluation.* In most states, monitoring and evaluation were hampered by the lack of state requirements for vital program and fiscal information. For example, fiscal information was not available in any standard format. There were no breakdowns by anticipated and actual expenditures, and except in some project proposals, no breakdowns by types of services funded. Actual enrollment figures were not available, and in most states, there was little information on completers, dropouts, and placements. Follow-up data were not available in any state. There were indications that some states recognized this problem and were taking steps to correct it. Sophisticated, computerized systems were being installed in several states, and in a few, program officers were reviewing the reporting requirements they impose on local education agencies and schools. For the most part, however, data necessary for monitoring and evaluating projects was seriously deficient at the state level.

### Summary

The deficiencies of state level administration of the Part B set-aside program for the handicapped must be measured against the low cost of state level administration. One program officer in each state is expected to consult with advisory councils, enter into cooperative agreements with outside agencies, and plan, fund, and monitor a statewide program. Nevertheless, if additional staff were allocated for state level administration, the chances are that there would be fewer funds available for direct services to the handicapped. It could happen no other way, unless state agencies agreed to absorb the increased administrative costs, or unless interagency agreements made it possible for staff from several agencies (special education and vocational rehabilitation, for example) to aid in the administration of set-aside programs.

At the present time, however, state level administrators consider themselves *solicitors* and *funders* of projects; they do not consider themselves *designers* of statewide programs. Thus information needed for planning, monitoring, and evaluation is not a major concern of program officers charged with the responsibility of administering the set-aside program.

## THE PROJECT LEVEL ASSESSMENT

The purpose of the project level assessment was to examine the various ways local administrators identified handicapped individuals who qualified for the program and how they used screening techniques, assessment techniques, counseling, instructional methods, and overall approaches to the provision of vocational education to the handicapped. In addition, both at the state and local levels, the perceptions of administrators regarding "mainstreaming" (the integration of handicapped students with the non-handicapped), revenue sharing, and the overall value of the set-aside program were obtained. Finally, the attempt was made to identify local policies regarding educational services for the handicapped, and to document the extent of local planning for the set-aside program.

### Definition of Project

For the purposes of this study, the term "project" was defined as a Part B set-aside grant to a school or local education agency for the purpose of providing *specific educational services* to the handicapped. Block grants to local education agencies for nonspecified services were not considered projects. Projects had identifying "project numbers," were designed to serve a stated number of handicapped students, and had time periods generally equal to those of the school year; e.g., September 1973 to June 1974. Projects were broken down in the following four categories:

(1) *Regular:* Handicapped students integrated into regular vocational education classes with non-handicapped students

(2) *Special:* Handicapped students enrolled in special classes for handicapped students only

(3) *Combination:* Handicapped students enrolled part of their time in special classes and part in regular classes, but who received extra support in the regular classes as well as the special

(4) *Other:* Programs for the development of curricula or the training of teachers and other personnel

Only the first three types of projects were considered in selecting the sample project. No projects for curricula development or the training of teachers were included in the sample of 92 projects.

## Statistical Overview

The search for statistical data at the local level was more successful than at the state level, but even at the local level, data considered critical to the assessment were not readily available. Researchers were forced to review enrollment and fiscal records, student rosters, and other information sources in the attempt to collect and tabulate such data as:

(1) Enrollment by handicapping condition
(2) Enrollment by sex and racial and ethnic background
(3) Enrollment by occupational offering
(4) Fiscal information, including local contributions
(5) Outcomes information, including dropouts, completers, and placements
(6) Follow-up data

The search was not always successful. Enrollment by handicapping conditions was not available for 20 percent of the 92 projects. Complete outcomes information was available for only 20 of the projects included in the representative subsample (74 of the 92 projects), and per-enrollee and per-completer costs could be computed for only 25 of the representative projects.

Nevertheless, the statistical overview revealed some interesting insights regarding the operation of the set-aside program in the 19 states which were included in the representative sample. It should be remembered that the sample of 92 projects was divided into two subsamples: (1) 74 projects in nineteen states which were representative of all projects operating in those nineteen states; and (2) 18 projects in three low enrollment states and California. Unless otherwise indicated, the statistical information presented below relates to the "representative" sample.

*Mainstreaming.* Nearly 70 percent of the projects included in the representative sample were categorized as "special," indicating that integration of the handicapped with regular students is still more a goal than a reality.

*Work experience.* Twenty percent of the projects were primarily work experience programs (that is, all or the majority of the students enrolled in these projects were placed in part-time jobs that were either related or unrelated to the instruction they were receiving in school). However, in an additional 30 percent of the projects, some students (usually a small minority) were referred to work experience classes. The quality of the work experience provided is discussed in connection with the "Instructional Program."

*Enrollment by handicapping condition.* Approximately 77 percent of all students enrolled in the 74 representative projects were classified as "mentally retarded." Of these, 12 percent were classified as "*trainable* mentally retarded," 15 percent were classified as "physically disabled," and the remainder were classified as follows: "learning disabled" (4 percent) and "seriously emotionally disturbed," "educationally handicapped," and "multihandicapped" (1 percent each).

National figures on the incidence of handicapping condition for school children between the ages of five and 19 (1968-69) revealed that if the category "speech impaired" were eliminated from the total, 89 percent of the children were in the following categories: mentally retarded (35 percent), emotionally disturbed (31 percent), and learning disabled (15 percent). These three categories accounted for 85 percent of the enrollment in the 74 representative projects; however, the incidence of mental retardation in the set-aside program (77 percent) was much higher than the national incidence figures.

*Enrollment by sex and racial and ethnic background.* Approximately 60 percent of the students enrolled in the 74 representative projects were men, 55 percent were white, 37 percent black, and the remaining 8 percent Spanish-surnamed, Oriental, and American Indian.

It should be emphasized that none of the data summarized above was readily available to either project administrators or researchers. The data had to be processed on site by means of record searches and detailed questioning of project directors. Thus, it seemed clear that problems relating to the accuracy and completeness of national and state data on the Part B set-aside program for the handicapped originated at the local level. The diverse methods used for funding projects, the lack of use of common definitions for key terms and handicapping conditions, and most important of all, the apparent lack of responsiveness at all levels to the need for monitoring and evaluation combined to create a management information system that was at best incomplete and at worst nonexistent.

This "lack of responsiveness" may have been due to the absence of resources necessary for the collection and processing of fiscal and program data; but irrespective of the reasons, it will probably take action at the federal level to improve the overall system. It is doubtful, however, that such action will be fruitful unless state and local administrators are consulted before improvements are instituted. The goal should be to aid local administrators in generating the kinds of information they need to maintain control over their programs. If the requirements of local administrators are satisfied and if local administrators understand the need for collecting complete and accurate data on their programs, it follows that state and national requirements will also be met.

## Policy and Planning

Prior to the 1968 amendments, policy regarding education for the handicapped was not a primary concern of educators at either the state or local levels. Since the amendments, state and local education officials have been forced to devote some attention to the handicapped. Class action suits in behalf of the handicapped and universal education legislation in some states have increased the pressure on local and state educators to provide comprehensive educational services for the handicapped. Because of these developments, overall policy toward providing educational services to the handicapped, including vocational education, appears to be emerging. However, clearly articulated policies and corrdinated planning have not yet occurred in most areas, although some local areas are more advanced than others.

One of the problems appears to be the fragmentation of educational agencies into special units, each with its own private line to funding sources at the state and federal levels. National vocational education administrators talk to state vocational education administrators, who in turn talk to their local counterparts. The same is true with special education, research divisions, and other units. The result is that vocational education programs for the handicapped are funded on an ad hoc basis, without policy and planning guidelines to aid those charged with initiating projects. While there can be no doubt that the resulting projects have been of benefit to the handicapped, most local education agencies have no way of knowing how many of their handicapped students are being served and the adquacy of the program mix.

## Project Administration

The amount of Part B set-aside funds that were allocated to individual projects constituted a minor proportion of all funds administered by local education agencies and schools. Perhaps for this reason, it was relatively easy for local education agencies and schools to absorb the administrative costs of the Pact B program. Certainly the vast majority of Part B set-aside funds, expended between fiscal years 1972-73 and 1973-74, were spent for direct services for the handicapped. This was one of the most positive findings of the project level assessment.

*Allocation of resources.* Data regarding the allocation of resources, by cost category, were collected for both school years 1972-73 (the base year) and school year 1973-74. Data regarding school year 1972-73 were presumably complete, whereas cost figures for school year 1973-74 (which was still in progress at the time the study took place) were "anticipated" cost figures. Nevertheless, comparisons between the complete 1972-73 fund allocations and anticipated 1973-74 allocations resulted in highly significant findings.

1. Both complete (1972-73) and anticipated (1973-74) cost breakdowns indicated that approximately 93 percent of all known funds allocated for the program were used to provide direct services to the handicapped.
2. In 1972-73, federal funds accounted for 74 percent of total expenditures; the corresponding figure for 1973-74 was only 58 percent, indicating that the Part B set-aside program had an accelerating effect on state and local contributions for vocational education programs for the handicapped.

*Organizational structure.* Part B set-aside programs were for the most part absorbed into the already existing organizational structures of the schools in which they took place. This is the major reason why the cost of administering the program was so low. On the other hand, the absorption of set-aside programs into traditional administrative structures tended to diffuse their special missions. The handicapped program was just another "special" program the schools had to administer. The amount of funds received by a single school to carry out a "project" constituted such a small percentage of all funds administered by the school (and were subject to year-to-year federal appropriations) that priority given to the handicapped program was generally no higher (and often lower) than priorities given to other programs administered by the schools.

*Staffing.* Personnel whose salaries were paid by set-aside funds were primarily instructors — either vocational education instructors for skills training, or special education teachers for prevocational training. Funds were also spent for "evaluators" in diagnostic centers and for paraprofessionals and teachers' aides.

*Use of nonproject staff and support.* Most projects were self-contained, i.e., whatever services were provided to the students were provided by the projects themselves without help from outside organizations.

*Staff training.* In all projects included in the sample, staff training was accomplished informally. However, most school districts encouraged staff to attend university courses, state seminars, AMIDS programs, and other training opportunities, and provided released time for such training.

*Relationship between vocational education and special education.* One of the most significant findings of the administrative assessment was that the relationship between vocational education and special education at the local level was so close that it was often difficult to distinguish between them. Considering that the two agencies often appeared to be separate "Baltic states" at the state level, this came somewhat as a surprise. In hindsight, however, it became clear how the two grew so close together. First, the organizational relationship between the two agencies was quite different at the local level; both reported directly to the same superior — the superintendent of schools — and both were concerned with the implementation of actual programs. State and national administrators were once- and twice-removed from the "firing line," thus bureaucratic concerns were more apt to take precedence over program concerns. At the local level, both agencies found themselves mutually dependent upon each other. The result was that old differences began to disappear as both sought to provide services for handicapped students.

*Reporting requirements.* Considering the lack of program information available at the local level, it was not surprising that reporting requirements imposed on project administrators by principals and by local education agencies and state administrators were minimal. Usually the only reports required to the states were fiscal. Seldom were outcomes and follow-up reports required at any level. Thus, whatever outcomes and follow-up records were kept depended solely upon the initiative of project administrators.

*Issues.* State and local administrators, project directors, counselors, and instructors were asked to comment on the following issues:

(1) The effect of the Part B set-aside funds on vocational programming for the handicapped

(2) What the effect of revenue sharing might be on progams for the handicapped

(3) The efficacy of integrating the handicapped with non-handicapped students

(4) Whether increased opportunities for work experience programs could be developed for the handicapped.

The latter two "issues" are discussed in more detail in the section on the instructional program below; the opinions of the educators interviewed on all four issues are summarized in this section.

1. *Part B set-aside:* Virtually all respondents (three state directors of vocational education dissented) maintained that without the set-aside program, vocational education for the handicapped would be for all intents and purposes nonexistent.

2. *Revenue sharing:* The consensus was that revenue sharing would have a negative effect on vocational programming for the handicapped. The explanation was that entrenched special interest groups (most of whom represent nonminority groups — or the loudest minorities) would see to it that funds that would otherwise have gone to the handicapped would be siphoned off for other purposes.

3. *Integration of the handicapped:* All but a few state administrators and two-thirds of the local educators interviewed said that it was the policies of their states and school districts to integrate the handicapped into regular classes. However, implementation was far from a reality. One of the major reasons cited for the lack of implementation was that it is easier to account for funds spent for "special" classes than it is for funds spent for "regular" classes. Other reasons cited were the reluctance or inability of teachers to accept (or teach) handicapped students, and the need of some handicapped individuals for special services that were not available in regular classrooms.

4. *Work experience:* The general consensus of all administrators interviewed was that work experience components should be initiated for the handicapped, and many school districts were astonishingly successful in promoting work experience situations for their handicapped students. The major constraints mentioned, which limited work experience components, were: (a) the reluctance of employers to hire handicapped individuals, and (b) the limited abilities of some handicapped students.

## The Instructional Program

Judging from the results obtained from the 92 projects included in the project sample, there were wide variations in both the type and quality of projects funded throughout the country under the Part B set-aside legislation. The goals of programs included at least the following: diagnosis and assessment, prevocational training, provision of counseling services, acquisition of special equipment, and of course, skills training. The clientele ranged from the severely mentally retarded and emotionally disturbed to high-level (or borderline) educable mentally retarded individuals. The teaching techniques varied from rudimentary to highly sophisticated, and the training that teachers received in serving the handicapped ranged from nonexistent (for most vocational instructors) to graduate degrees in special education (for some special education personnel). Projects were regular, special, and a combination of the two and they were operating in depressed rural areas and suburban and urban areas with varying unemployment rates and industrial mixes. For example, the instructional content ran the gamut from a program in New York City to teach trainable mentally retarded students how to travel on the subway to a highly sophisticated skills training program in the suburbs of Detroit for students with several different types of handicaps.

Indeed, the variations encountered in the field were so great that it was impossible to synthesize the 92 projects into categories of vocational programming for the handicapped, and in some ways, the overall program defied analysis — statistical or otherwise. Nevertheless, some of the more important issues for the future were identified during the course of the assessment of the instructional program.

*Selection and referral.* The most important findings regarding the selection and referral process were as follows:

1. The evaluation and classification of students *by handicapping condition* generally occurred long before the students were referred into the vocational program.
2. Student aptitude assessments were occasionally (but not always) performed by vocational educators.
3. The most common sources of referrals for projects in comprehensive and vocational high schools were special education classes either in the high schools or in the elementary schools of the school districts. Students enrolled in "regular" classes were sometimes referred to the projects by instructors and/or guidance counselors, but they constituted a minority of the enrollment in the overall program. In institutions for the handicapped, students already enrolled were placed in the set-aside projects. Sheltered workshops enrolled students from institutions, special education classes, and in a few cases, youngsters who were not enrolled in schools, or students who had completed skills training programs but were not yet ready for outside employment.
4. The classification of students in mentally handicapped categories (except for trainable mentally retarded) was a source of tension to educators, students, and the general public. The use of IQ tests to measure mental retardation was being challenged in many areas by minority groups and their advocates. The trend was toward categorizing all handicapped students (as well as disadvantaged students) into a "special needs" category. (HR 69, which permits parents access to school records will probably cause an acceleration in this trend.)
5. In many areas, especially depressed rural areas, there was a tendency to ignore distinctions between "disadvantaged" and "handicapped" students.

It should be emphasized that most of the personnel interviewed in connection with the project level assessment were "project," or vocational education administrators and instructors. Their knowledge of the evaluation and diagnosis process was at best superficial. It was therefore not possible to assess the evaluation and diagnosis process in depth. However, regardless of how "special needs" students may be classified (handi-

152

capped, disadvantaged, and so on), those referred to the vocational program should undergo further assessments to determine aptitudes and educational needs. Such "aptitude assessments" — which are a vocational education responsibility — were not conducted in most projects.

*Curriculum and teaching methods.* Nearly all of the instructors who were interviewed expressed a theoretical commitment to individualized instruction, but as with "mainstreaming," that commitment had not yet been translated into action — except to the extent that "hands-on" vocational training (which by its very nature is individualized) was practiced. The reasons for this discrepancy were that most classroom teachers did not have the time to develop their own material; nor did they have access to materials already developed. Why the latter is true was unclear, but it was seldom that state-developed curriculum materials were found at the project level. This lack of individualized instruction throughout the set-aside program may be one of the major reasons that despite policies to the contrary, handicapped students were placed for the most part in special rather than regular classes.

*Occupational offerings.* The definition of vocational education contained in the 1968 amendments is in part as follows:

> . . . vocational or technical training or retraining which is given in schools or classes (including field or laboratory work and remedial or related academic and technical instruction incident thereto) under public supervision and control or under contract with a state board or local education agency and is conducted as part of a program designed to prepare individuals *for gainful employment or semi-skilled or skilled workers or technicians or subprofessionals in recognized occupations* (emphasis added).

This language indicates that vocational education for the handicapped means "skills training," or training for "gainful employment" in skilled, semi-skilled, or technical positions. However, data taken from class enrollment figures for all 92 projects indicate that 63 percent of the handicapped students enrolled in set-aside programs were in nonskills training courses. Of these, 52 percent were enrolled in prevocational courses.

The "other than skills training" category includes, in addition to prevocational training, the following: mobility instruction, evaluation, travel training, sheltered workshops (other than as work experience stations), industrial arts, and tutoring. Nongainful home economic courses (mainly for women) included sewing, home cooking, and homemaking.

This raises the question as to whether set-aside funds were in most instances being used to fulfill the intent of the Act. For example, should nonskills training courses be financed with vocational education funds or with other funds appropriated for the handicapped? The answer to this question depends to a great extent upon the types of handicapped individuals who are referred into the program. If trainable mentally retarded individuals are referred to the vocational education program — 12 percent of the total enrollment was classified as "trainable" — skills training may not always be possible. The same is true with seriously educable mentally retarded students who were often enrolled in sheltered workshops, and to many students who were classified as seriously emotionally disturbed and learning-disabled.

These issues reflect an absence of planning at any level for overall educational services for the handicapped. It would seem that the first priority of the set-aside program should be to provide skills training for handicapped individuals who, although they may need special educational services to succeed in vocational education programs, were judged capable of competing on the open labor market with non-handicapped individuals. If vocational education were to serve this target group, other funds (special education funds, for example) could be used to provide nonskills training for those who are not, and never will be, capable of competing on the open labor market. However, if this were to happen, it would necessitate coordinated planning, from the local to the national level, involving such agencies as special education, vocational education, research and statistical units, vocational rehabilitation, and perhaps others. Such planning was not taking place in most of the areas visited in conjunction with the project level assessment.

The courses in the 92 projects ranged over the entire spectrum of vocational education offerings, but the largest numbers were in the trade and industrial category (primarily male), home economics (primarily female), and prevocational (primarily younger students). As in other programs, the range of training was considerably wider for men than for women. Most female students were enrolled in home economics, health occupations, and prevocational training. The remainder was scattered throughout distributive education and office and clerical classes. Of course, the number of occupational offerings included in the trade and industrial category is much larger than the number of occupations in the home economics and health occupations categories. This factor, more than any other, accounted for the wider range of occupational training for men.

*Work experience.* Approximately 25 percent of the students enrolled in the 92 projects were in work experience programs; that is, they spent part of their time in school and part of their time on a job. However, only one of the 92 projects was a cooperative program; that is, the work the students were performing on the job was related to the instruction they were receiving in the classroom. Most of the jobs being performed by handicapped students were "work experience" or "income maintenance" positions; they were *not* related to the instruction they were receiving in the classroom. Many of the work stations were in sheltered workshops, and most of those in private firms were jobs requiring limited skills.

*Mixing the handicapped with the disadvantaged.* There was a trend, especially in rural areas, to mix the handicapped and the disadvantaged in the same classes. Some administrators justified this on the ground that if they did not mix the two together, there would not be enough students in either category for the school to qualify for state grants. However, in most cases, the educational needs of the two groups were quite different, and in almost every case, there was no doubt that those classified as disadvantaged resented being placed in classes with those categorized as mentally retarded. This was especially true in large cities where the disadvantaged were members of minority groups and the mentally retarded were not. If both the disadvantaged and handicapped were referred to "regular" classes, there was no problem; but where they were grouped together in "special" classes, the atmosphere — for the disadvantaged at least — was not conducive to learning.

*Guidance and counseling.* Only a few of the larger projects paid for guidance and counseling personnel from project funds. Most students enrolled in the set-aside programs had other school attachments and, theoretically at least, had access to the regular school guidance and counseling staff. Within projects, project directors and work experience coordinators were most likely to serve as surrogate counselors. The instructors of special classes and prevocational courses were more likely to deal with the individual problems of their students than the instructors of regular classes.

*Equipment and materials.* The quality of equipment and materials did not appear to be a major concern to most project personnel. Most rated available equipment as "adequate" or better. This may be due to the fact that the majority of students was in the educable mentally retarded category and used the same equipment provided for regular classes. Most physical and sensory handicapped students were enrolled in institutions, which in most cases, were excellently equipped to deal with specific handicaps.

*Program costs and outcomes.* Program costs could be calculated for 25 of the representative projects, and outcomes information was available for 20 of the representative projects. The cost information for the 25 projects is as follows:

| *Category* | *Number* | *Cost* |
|---|---|---|
| (1) Total enrollment: | 2,749 | |
| (2) Total completers: | 1,456 | |
| (3) Total combined costs (federal, state, and local) | | $3,491,001 |
| (4) Total federal costs | | 1,268,090 |
| (a) Combined costs per enrollee | | 1,270 |
| (b) Federal costs per enrollee | | 462 |
| (c) Combined costs per completer | | 2,398 |
| (d) Federal costs per completer | | 871 |

*Outcomes information.* Of the 2,009 students enrolled in the twenty projects for which outcomes information was available, only 6 percent dropped out, 57 percent completed, and 48 percent of the completers were placed in jobs, 58 percent of which were training related. Approximately 33 percent of the completers reenrolled in regular vocational education programs or in other training.

Because of the sparsity of outcomes information, it was not possible to compare completer or placement rates by type of training received; nor was it possible to compare the costs of various types of programs. However, the case study interviews (summarized in the next section) indicated that work experience completers earned more in the jobs they obtained than those who were not in work experience programs. The employer interviews indicated that one of the major constraints limiting the expansion of work experience programs is that many employers believe that if they hired the handicapped, they would have to make major changes in their work environments.

### Case Study Interviews

The case study inteviews indicated that both students and parents expressed extremely favorable attitudes toward the projects in which they or their children were enrolled. If one judges solely in terms of expressed attitudes, the Part B set-aside program for the handicapped appeared to be a success.

1. *Student assessment:* Student evaluation of the program was fundamentally good. Most liked the training they received and the people with whom they associated. They found that tools and equipment were not too hard to operate, classes were not boring, and the environment was generally favorable in terms of teachers, classmates, and working conditions.
2. *Parent assessment:* Of the parents interviewed, 76 percent rated the programs either "excellent" or "good." Two out of three parents perceived their children as having improved in the areas of self-reliance, self-image, and social mixing ability since the children had begun participating in the program.

Because of the absence of a control group, it was impossible to determine whether the project participants interviewed were more successful in finding jobs than their handicapped counterparts who did not participate in the program. Nevertheless, the outcomes information appears to be favorable:

1. Four out of 10 completers who were still enrolled in school were employed.
2. Six out of 10 completers who were no longer in school were employed.
3. The average wage received by completers out of school was $2.17 an hour; the corresponding figure for completers in school was $2.07 an hour.
4. Of the employed completers, 70 percent were in service occupations (41 percent), miscellaneous occupations (18 percent), and clerical and sales (11 percent).
5. Eighty-four percent of the completers were employed in the following industries: miscellaneous service (36 percent), trade (20 percent), government (14 percent), and manufacturing (14 percent).
6. Work experience students earn more than those not enrolled in this type of program, although the placement rates for the two groups are about the same.

Participating employers expressed favorable attitudes toward the program. Three out of four participating employers rated the performance of handicapped students and/or completers "as good" or "better than" regular workers in each of eight performance scales.

Nonparticipating employers were not quite so disposed to be in favor of the program as their participating counterparts:

1. Of the nonparticipating employers, 52 percent had negative feelings about participating in the program.
2. When compared to participating employers, nonparticipating employers were more likely to believe that hiring handicapped individuals would require significant changes in their business environments.
3. Sixty-one percent of the nonparticipating employers had heard of the program and 14 percent had previously participated in it.
4. Only 16 out of a total of 71 nonparticipating employers had been directly approached and refused to participate.

The interviews also revealed some interesting attitudes on the part of students toward different types of programs. For example, students in regular classes were more apt to express favorable opinions regarding their relationships with teachers and classmates, yet they were more apt to be bored than students in special classes. Students in sheltered workshops expressed above-average dislike for "working conditions," instructors (or supervisors), and their fellow students (or workers). The percentage of sheltered workshop students who could find nothing good to say about their programs (10 percent) was twice as high as for participant sample as a whole. Yet students in sheltered workshops were less apt to be bored than their counterparts in other classes. Finally, students in state institutions expressed above-average dislike for their programs.

## CONCLUSIONS OF THE ASSESSMENT

As was stated in the introduction to this report, the study conducted by ORC was an *assessment* not an *evaluation* of the Part B set-aside program for the handicapped. Yet it is inevitable that the study's conclusions contain, or at least *imply*, value judgments, some of which are favorable to the program and some of which are not. We have therefore attempted to bolster the conclusions summarized below with as much hard data as possible. Nevertheless, we recognize that some of the issues raised by the study are not only complicated, but emotion-packed, and that they do not lend themselves to easy solutions. It is our hope that the findings, conclusions, and recommendations of the assessment will be of use in improving a program which already has proved its value in making available new educational opportunities to handicapped students throughout the country. The conclusions are arranged in four categories: general, administrative, program, and issues.

## GENERAL

Nearly 400 administrators, instructors, and other staff were interviewed in conjunction with this study. The almost unanimous opinion of the respondents was that without the Part B set-aside legislation, there would be very little vocational programming for the handicapped in any state. This opinion was supported by hard statistical data.

### Effect of the Part B Set-Aside Concept

Fiscal year 1973 data reported by the states to the U.S. Office of Education indicated that in 17 states there were no differences between total vocational education expenditures for the handicapped and total expenditures under the Part B set-aside. In all but a few states, the differences were not significant. Data from the project level assessment show that during school year 1972-73, federal funds accounted for 74 percent of all funds (federal, state, and local) spent on set-aside programs. Equally significant, during school year 1973-74 the percentage of federal expenditures for set-aside programs dropped from 74 to 58, indicating that the set-aside program may be having an accelerating effect on state and local contributions to vocational education programs for the handicapped.

### Do Set-Aside Funds Reach the Handicapped?

An analysis conducted of the allocation of set-aside funds, by cost categories, indicated that in both school years 1972-73 and 1973-74, the vast majority of set-aside funds was used to provide direct services to the handicapped. Of these funds, 93 percent was used to hire staff who work directly with handicapped students or who purchase equipment, materials, and supplies. Only 7 percent was used for administrative purposes.

### Program Constraints

Both state and local administrators cited the lack of trained staff and the reluctance of instructors in regular classes to accept the handicapped as the major constraints limiting the expansion of vocational education programs for the handicapped. However, it is obvious that if the set-aside program were to be discontinued, the number of vocational training opportunities for the handicapped would suffer a drastic decrease. In other words, "lack of funds," or the reluctance to spend funds for vocational programming for the handicapped, may be the major constraint limiting expansion of vocational education programs for the handicapped.

### Overall Performance

Costs and outcomes data were seriously deficient at both the state and local levels. However, according to what little data were available and to the results of the student, parent, and employer interviews, the program appeared to be working well. Costs per student and completer were not excessive, and placement rates ranged from 48 to 60 percent for completers. Considering that about 33 percent of the completers reenrolled in school, one can see that the placement rate was good. Only 15 percent of the completers were unemployed, and the dropout rate, at 6 percent, was very low. It should be emphasized, however, that costs and outcomes analyses were possible for only about a third of the projects included in the representative sample.

Both parents and students were favorably impressed by the program, and participating employers gave their handicapped employees high ratings in almost every work performance category.

## ADMINISTRATION

The administrative aspects of the program are discussed below.

## Policy

Clear and articulate policy issuances directed toward providing comprehensive educational services for the handicapped, including vocational education, were lacking at both the state and local levels. Because of the enactment of the set-aside program, right-to-education suits, and universal education legislation in some states, state and local education agencies were becoming more aware of their responsibilities toward the handicapped. Yet most states and local education agencies were *reacting* to these developments, rather than acting to create *comprehensive* educational programs for the handicapped. What are needed most are policy issuances directing the various educational divisions with responsibility for the handicapped to work together in creating such programs. The fragmentation of educational agencies into special units, each with its own private line to funding sources at the state and federal levels, is one of the major inhibitors to comprehensive educational programming for the handicapped. It is unrealistic to expect divisions of vocational and special education to initiate such policies. They must emanate from the highest levels of the educational hierarchies.

## Planning

It would be an exaggeration to state that no planning takes place at the state and local levels; but it is accurate to maintain that what planning does take place is of a short-term nature, generally directed toward justifying certain projects. It would be unfair to place the blame for lack of planning solely on vocational education administrators. It is the responsibility of vocational education to provide a specific kind of educational service to all who are referred to the vocational education program — handicapped and nonhandicapped; it is not the responsibility of vocational education to identify, assess, and recruit all handicapped individuals coming up through the educational system who should be placed in vocational education programs. Thus if long-range plans are to be launched to provide comprehensive educational programs for the handicapped, including vocational education, pertinent divisions of educational agencies — at both the state and local levels — must work together.

There was little evidence of this kind of cooperation at either the state or local levels. When asked about the universe of need, or the establishment of priorities, most respondents expressed bewilderment. "Planning," if it can be called that, consisted mainly of state program officers soliciting project proposals from local administrators. At the local level, it generally consisted of vocational educators getting together with special educators to determine what kinds of projects should be funded and what types of students should be referred to the projects. The object was to spend the funds (Part B set-aside funds) available from the states. While there can be no doubt that the resulting projects were of benefit to the handicapped, most states and local education agencies had no way of knowing how many of their handicapped students were being served or if the program mix was adequate.

## Monitoring and Evaluation

Monitoring and evaluation depend to a great extent on the collection and tabulation of hard statistical data. They also depend on the presentation of such data in a form that is readily understandable to project administrators. Adequate management information systems were extremely rare at both the state and local levels. In many cases, important information was buried in files, but it was seldom that such information was processed for management purposes. In addition, common definitions for such terms as "handicapping condition" and "completer" were not used; nor were local administrators aware of sources (federal and state) from which project funds were obtained. Complete enrollment, fiscal, and outcomes information was not available from any state and from only a handful of projects. Little attempt was made to collect follow-up information. Much of the program and fiscal data reported by the states to the Office of Education were either incomplete or inaccurate. The lack of adequate management information, together with other weaknesses which will be discussed in subsequent sections, resulted in poor monitoring and evaluation at the state and local levels.

## Funding Procedures

Monitoring and evaluation also depend upon whether measurable goals are set for programs and whether performance standards are established. Proposals for grants from local education agencies to the states should contain such goals and performance standards. In states which provided block grants to local education agencies, no such goals or standards existed, and the states had very little control over local programs. In the majority of states which funded "projects" on the basis of proposals submitted by schools and local education agencies, goals and standards generally existed, although in many cases, the goals stated were too general to be measurable. Fiscal accountability was much better in states which funded projects. In the block grant states, local administrators did not apply funds from various sources against expenditures until *after the close of the school or fiscal year*. Thus the use of set-aside funds became a bookkeeping rather than a program responsibility.

Special note should be made of the following:

1. A few states have devised methods for the joint funding of projects with other agencies — agencies both inside and outside the educational establishment — without violating regulations against the co-mingling of funds. Since co-mingling is often mentioned as a constraint limiting joint funding, the accounting methods used by these states should be disseminated to all state program officers.
2. Several states employ the "seed money" concept in funding projects; that is, set-aside funds are granted to local education agencies only on condition that over a period of time the projects will become 100 percent supported by local funds. The results of the seed money concept, if it proves successful, could have significant implications for the set-aside program.
3. One of the most often mentioned constraints limiting the funding of regular projects (projects which integrate the handicapped with nonhandicapped students) is that it is too difficult to prove that such funds are used exclusively to purchase services for the handicapped. Yet several states as a matter of policy fund only regular projects and have no difficulty accounting for the use of set-aside funds. The techniques used by such states should also be disseminated to all state program officers.

## Organization

Primarily because the Part B set-aside program has been absorbed into existing administrative structures at both the state and local levels, the administrative cost of the program has been low. Although this is a positive finding, it has its negative aspects. Many of the administrative responsibilities mandated in the 1968 amendments were not performed, and state program officers became solicitors and funders of projects rather than designers of state programs. Priorities given to set-aside projects at the local level were generally no higher (and often lower) than priorities given to other programs.

## PROGRAM

Four program components — curriculum development, teacher training, occupational offerings, and work experience — are discussed below.

### Curriculum Development

Almost all instructors interviewed expressed a theoretical commitment to individualized instruction, but in most areas that commitment had not yet been translated into action — except to the extent that "hands-on" vocational training (which by its very nature is individualized) was practiced.

Most projects in states which successfully implemented policies directed toward "mainstreaming" the handicapped (that is, placing them in regular classes with the non-handicapped) used individualized instruction techniques and advanced curricula. Thus the failure to effect mainstreaming in most areas may be partially due either to the nonuse of existing curriculum materials or the lack of such materials.

### Teacher Training

One of the most often mentioned constraints limiting the expansion of vocational education programs for the handicapped was the reluctance of teachers in regular classrooms to accept the handicapped, or the inability of teachers to instruct handicapped students. Thus teacher training in special education techniques was considered a necessity, not only to help effect program expansion, but also to improve program quality.

### Occupational Offerings

Two-thirds of the training provided under the set-aside program was nonskills training, that is, training not intended to prepare students to compete in the open labor market in any given skill, craft, or trade. Half of the students enrolled in this type of training were in prevocational courses. Others were enrolled in diagnostic centers, mobility training, nongainful home economics, industrial arts, tutoring, and sheltered workshops.

Of those enrolled in skills training, the vast majority was in trade and industrial courses, mainly for men. The range of occupational offerings for women was extremely narrow, being confined mainly to home economics (much of which was not gainful) and health occupations.

### Work Experience

In half of the projects included in the project sample, at least some students were referred into work experience programs. Approximately 30 percent of the projects were classified as Part B "work experience" programs (all students in such programs were receiving work experience of some kind). However, Parts G and H programming for the handicapped was minimal, and in most instances, the work stations to which handicapped students were assigned were not related in any way to the instruction they were receiving in school, were unskilled in nature, and were intended mainly to provide students with "work experience."

Unlike participating employers, nonparticipating employers expressed the belief that it would be necessary to effect radical changes in their working environments if they were to hire the handicapped. State and local administrators cited the reluctance of employers and the limitations of some handicapped students as the major constraints limiting the expansion of work experience programs for the handicapped. An additional constraint may be that too little is done at the state and local levels to promote employer participation in vocational education programs for the handicapped.

## ISSUES

Approximately 15 percent of those enrolled in the set-aside program were classified as trainable mentally retarded, seriously emotionally disturbed and learning disabled. In addition, many of those classified as educable mentally retarded were borderline trainables. One of the reasons why so much of the training provided under the Part B set-aside was of the nonskill type was that many of the individuals referred into the program did not have the capacity to participate in advanced skills training programs. Some states concentrated on the younger handicapped students, which explains why so much of the programming was prevocational.

### Program Priorities

Many administrators throughout the country voiced the opinion that trainable mentally retarded students and other handicapped individuals who, according to medical and psychological diagnoses, will never be able to compete on the open labor market, should not be referred to the set-aside program. A few states established policies which, in effect, barred the placement of such individuals in *vocational education* programs. The question is one of priorities. If one considers that funding for the handicapped comes from many different sources and that groups of handicapped individuals have varying educational needs, the question arises: Which funds should be used to provide which services? The consensus was that the first priority for the set-aside program should be those handicapped individuals who, although they may need special services to succeed in a vocational education program, nevertheless have the capacity to compete on the open labor market in certain occupational areas. With respect to prevocational programming for younger students, the prevocational training should be tied into, or lead to, later skills training. Because of the absence of policy and planning at both the state and local levels, priorities for the set-aside program generally were not established.

### Mainstreaming

Approximately two-thirds of the local administrators who were interviewed said that it was the policy of their school districts to integrate the handicapped with regular students. Twenty reported no policy in this area, and eleven said that they did not know whether such a policy existed. However, in most areas where the policy called for integration, implementation was still far from a reality. Of the students enrolled in the program, 70 percent were in "special" classes. As noted previously, there were several reasons for lack of implementation: (1) reluctance of instructors to accept handicapped students, (2) inability of instructors to teach the handicapped, (3) lack of individualized instruction techniques in most projects, and (4) referral (into the program) of individuals who could not succeed in advanced skills training classes (trainable mentally retarded students, for example).

However, there is also the question: Is integration always the best policy? There appears to be a real danger that handicapped students will become lost in regular classes, or that they will not receive the special support they need from instructors and students of regular classes. One of the findings of the student interviews supports this contention, that is, that students in regular classes were more apt to become bored than students in special classes. There were numerous examples of special projects wherein handicapped students received vital support from both their fellow students and their instructors. Perhaps the answer is "combination" projects, similar to those often funded in Michigan, Wisconsin, and Minnesota. Students in combination projects spent part of their time in special classes and part in regular classes, but they received extra support in both the special and regular components.

### Diagnosis and Assessment

Diagnosis of handicapping condition was not a vocational education responsibility. Nevertheless, the classification of students into mentally handicapped categories was encountering difficulties throughout the country. The use of IQ scores to classify students as mentally retarded was being challenged in many areas, especially by minority groups. The trend in many states and local areas was to discontinue categorizing students by specific types of handicaps and, instead, to place all handicapped individuals in the "special needs" category.

This trend makes it incumbent on vocational education to perform educational assessments of the special needs students who are referred for training. Thorough educational assessments, including individualized education plans, by vocational education were performed in only a small minority of the sample projects.

### Mixing the Handicapped and Disadvantaged

In smaller schools, no attempt was made to separate educable mentally retarded students from the disadvantaged, and in some of the larger schools, disadvantaged students were placed in special classes with the mentally retarded. Since the educational needs of the disadvantaged and handicapped are usually different, and since the disadvantaged, understandably, were often humiliated by being placed in classes with the mentally retarded, the mixing of the mentally handicapped with the disadvantaged is indeed a questionable practice.

### Revenue Sharing

Most state and local administrators said that revenue sharing would have a negative effect on vocational education programs for the handicapped and on vocational education in general. The consensus was that entrenched special interest groups would see to it that funds that otherwise would have gone to the handicapped would be siphoned off for other purposes.

## RECOMMENDATIONS

Based on the conclusions summarized above, we offer the following recommendations:

1. *Extension of the Part B set-aside:* Despite administrative and program deficiencies, the Part B set-aside program has proved its worth in making available new educational opportunities to handicapped students, and it should be continued.
   a. *Set-aside for all special-needs students:* Set-aside provisions for the handicapped and for the disadvantaged should *not* be combined. The educational needs of the handicapped and the disadvantaged are usually different and should be considered separately. Moreover, if the two categories are combined, there would be no assurance that the states would allocate funds to the two groups on a proportional basis. Therefore, one of the two groups would suffer a paucity of programming in some areas.
   b. *Monitoring the set-aside provisions:* There is evidence that some states may not be expending 10 percent of their basic grants on programs for the handicapped. The U.S. Office of Education should monitor this situation closely.
2. *Teacher training and retraining:* There are few persons who have been trained in both special education and vocational education. There is a need for undergraduate teacher education programs which will produce individuals qualified in both fields. Graduate programs for training vocational education teachers in special education and vice versa are also needed. *Both types of programs should require internships in Part B projects.*
3. *Instructional systems for the handicapped:* Research in the area of in-

structional systems for the handicapped is urgently needed. Basic, applied, and comparative research in this area will give a needed boost to instructional technology as it applies to the handicapped. Many teachers and employers suggest that their unwillingness to work with handicapped students is related not only to their lack of knowledge regarding "how to" teach or supervise, but to a greater lack of *societal* knowledge regarding the needs, learning styles, and cognitive structures of persons with special needs. This research should relate directly to or take place in Part B programs.

4. *Promotion of coordinated educational programs for the handicapped:* Consideration should be given to providing some states with grants for pilot programs directed toward accomplishing coordinated, interagency policy making, planning, monitoring, and evaluation of *all* educational programs for the handicapped, including vocational education. Such programs should include identifying the universe of need in local areas and for the state as a whole, identifying funds from all sources available to meet those needs, establishing priorities based on needs and available funds for each type of program, and establishing management information systems for monitoring and evaluation purposes.

5. *Dissemination of information:* The U.S. Office of Education should collect and disseminate to the states information of value in administering the Part B set-aside program. The methods used by some states to effect joint funding of projects, account for funds used in financing regular projects, and incorporate the "seed money" concept are examples of information that should receive wide dissemination throughout the states.

6. *Improvement of data collection systems:* The U.S. Office of Education, in consultation with state and local educators and administrators, should take action to improve local and state data collection systems. The Office of Education should be particularly concerned with the quality of information on the Part B set-aside program for the handicapped that is reported to the federal government by the states. However, improvement of data collected by the states depends to a great extent on the quality of data collected at the local level. The emphasis, therefore, should be on the data *local* administrators need to maintain control over their programs.

7. *Curriculum development:* Curricula for skills training, which would incorporate individualized instruction techniques, are necessary if handicapped individuals are to be integrated into classes with the non-handicapped. Although a great deal of such material has been developed, it is not widely used. Evaluations of existing material should be made, and efforts should be made at the state level to promote the use of superior curricula materials in Part B set-aside projects. In some areas, technical assistance to project instructors may be necessary. The states should be prepared to provide such technical assistance.

8. *Program mix:* The amount of skills training provided under the set-aside program should be increased, and all prevocational programs should be tied into later skills training. Individual education plans should be developed for each student referred into the set-aside program. Such plans should be directed toward providing comprehensive educational services, both nonskills and skills training, for handicapped individuals enrolled in the vocational education program.

9. *Occupational offerings for women:* The range of occupational offerings for women in the set-aside program is very narrow. States should take action to widen the occupational offerings available to women, including those in the trade and industrial area.

   a. *Home economics:* State guidelines for home economics courses should be reviewed to make certain

163

that such courses do not preclude either work or laboratory experience because of the few hours per week students spend in home economics courses. Many of the home economics courses in which set-aside students were enrolled appeared to lack laboratory and/or work experience. As a result, they were listed in the "nongainful" home economics category; the program did not seem to be preparing students for "gainful employment in a recognized occupation."

10. *Work experience:* Consideration should be given to allocating portions of Parts G and H set-asides for the handicapped. Programming for the handicapped under Parts G and H was for all practical purposes nonexistent.

a. *Employer promotion:* Aggressive campaigns to promote participation by employers in Part B set-aside programs should be launched at both the national and state levels. Employers who are now participating in the program should be enlisted to help in these campaigns. The keynote should be to break down the biases of employers who believe that the employment of handicapped individuals would cause wholesale changes in their working environments or that supervision of the handicapped would be difficult. The results of the employer interviews show that such changes are *not* necessary and that handicapped workers receive high ratings from participating employers in all performance categories. Use should be made of this information.

11. *Enrollment priority:* Priority for enrollment in the set-aside program should be given to those handicapped individuals who, after training, can compete in the open labor market in certain occupational areas. Funds from other sources should be used to provide educational services for individuals who are unlikely to be able to compete on the open labor market or who are unable to benefit from advanced skills training. Of course, periodic reassessments should be made of all handicapped individuals to make certain that those who make educational advances are not locked into set and never-changing programs. Furthermore, if all in the *priority* target population is enrolled in a given state or area, and all set-aside funds have not been spent, projects for the more severely handicapped, or those who may require services over a longer period of time before they can become competitive, should be instituted.

12. *Educational assessments:* Although it is not a responsibility of vocational education to diagnose and classify individuals by handicapping condition, it is a vocational education responsibility to perform thorough educational assessments of handicapped students who are referred into the program. The states should require that such assessments be made for all special needs students who are referred to the vocational education program.

164

# Iowa Vocational Education Special Needs Assessment Survey

CHARLES S. GREENWOOD
Drake University
RAYMOND E. MORLEY
Iowa Department of Public Instruction

## INTRODUCTION

The implementation of vocational special needs programs for disadvantaged and handicapped students in Iowa is administered by the Special Needs Section of the Iowa State Department of Public Instruction (DPI). Support for special needs programming is authorized at the federal level by the Vocational Education Act of 1963, amended in 1968, 1972 and 1976. The 1976 Amendments to the Vocational Education Act requre a minimum of 30 percent (20% for disadvantaged and 10% for handicapped) of each state's federal vocational allotment to be used for providing vocational education services for disadvantaged and handicapped populations. The administration of that federal act within the state is authorized by "The Iowa State Plan for The Administration of Vocational Education Within Career Education."

In 1976 the Special Needs Section of DPI defined as one of its top priority objectives the completion of a state-wide survey of secondary vocational educators to determine the extent to which services were being provided disadvantaged and handicapped students in vocational classes and the areas of support which need attention. The development, administration, data analysis and reporting of the findings were completed through a joint agreement with Drake University College of Education. The results will be used in the administration of programming as evidenced in "The Iowa State Plan for the Administration of Vocational Education."

Items for the survey instrument were developed in cooperation with the subject-matter consultants (Office Education, Distributive Education, Vocational Agriculture, Homemaking Education, Trade and Industrial) in the Career Education branch of DPI. Once developed, the survey items were given to 10 vocational teachers at four Des Moines high schools for further comment on clarity, utility and efficiency.

Every effort was made to collect the information requested on the survey directly from the classroom teacher. Survey forms were addressed and distributed to individual teachers using a list provided by the Management Information Division of DPI. That list consisted of over 4,000 names of persons who were certified to teach the subjects that were the focus of the survey. As it turned out, however, many of those persons were indeed certified to teach those subjects but are not doing so for varying reasons. The best estimate of the number of vocational teachers (as defined by the survey authors) in Iowa is less than 2,000. A large number of survey forms were returned with the message that that person is not involved in vocational education.

Usable survey instruments were returned by 1,265 of the nearly 2,000 secondary vocational educators in

---

CHARLES S. GREENWOOD is with Drake University, Des Moines, Iowa. RAYMOND E. MORLEY is with the Iowa Department of Public Instruction, Des Moines, Iowa.

Iowa. Delivery and return of the survey instruments was done through the Area Education Agency media delivery services. That proved to be both an efficient and a cost-saving method, resulting in a savings of $1,500 in postage alone. Iowa is divided into 15 geographical multicounty service areas for the administration and delivery of special education, media, staff development, and consultative services in other curriculum areas. These administrative units are known as Area Education Agencies (A.E.A.'s).

Although the return rate varied from a high of 84 percent from one A.E.A. to a low 44 percent in another, the overall return rate was 65 percent. That was deemed to be a sufficient return for the intended use of the data. It was not anticipated that any inferential statistical procedures would be necessary to meet the needs of the users. It should be noted that all tables in this report do not total to 1,265 responses. In some instances instruments were returned with data missing or incomplete for some items on the survey. In those cases only the usable data is reported.

Data gathered dealt with five components of local vocational programs: (1) professional backgrounds and attitudes of instructors, (2) designation of services currently available to special needs students, (3) class enrollment data, (4) identification of problems in dealing with special needs students, and (5) identification of potential solutions to the problems. Each component is reported in a separate section of this report. Data collected are tabulated to reflect responses on the state level of analysis, and are simply to promote readability and discussion. Other data analysis done, but not reported herein include analysis of all information by discipline, by A.E.A., and by size of school district. Questions concerning this report and the availability of the raw data collected should be directed to: Dr. Raymond Morley, Consultant, Special Needs Section, Grimes State Office Building, Des Moines, Iowa 50319.

## PROFESSIONAL BACKGROUND AND ATTITUDES OF INSTRUCTORS

For purposes of this survey, "vocational teachers" were considered to be any secondary teacher meeting classes in business education, including Distributive and Office Education, Vocational Agriculture, Industrial Edu-

**TABLE 1**

Number of Iowa Survey Respondents by A.E.A.

| A.E.A | Number | % of A.E.A Voc. Teachers | % of Total |
|---|---|---|---|
| 1 | 97 | 78.2 | 7.7 |
| 2 | 66 | 56.4 | 5.2 |
| 3 | 31 | 43.6 | 2.4 |
| 4 | 70 | 63.0 | 5.5 |
| 5 | 98 | 67.1 | 7.7 |
| 6 | 58 | 69.0 | 4.6 |
| 7 | 67 | 50.7 | 5.3 |
| 9 | 99 | 58.9 | 7.8 |
| 10 | 111 | 58.7 | 8.8 |
| 11 | 217 | 57.4 | 17.2 |
| 12 | 96 | 66.2 | 7.6 |
| 13 | 104 | 70.7 | 8.2 |
| 14 | 54 | 84.3 | 4.3 |
| 15 | 58 | 53.7 | 4.6 |
| 16 | 39 | 52.0 | 3.0 |

**TABLE 2**
Number of Iowa Survey Respondents by Size of School District

| District Population* | Number | % of Total |
|---|---|---|
| 145- 499 | 169 | 13.3 |
| 500- 749 | 182 | 14.4 |
| 750- 999 | 144 | 11.4 |
| 1000-1499 | 145 | 11.5 |
| 1500-1999 | 83 | 6.6 |
| 2000-2999 | 138 | 10.9 |
| 3000-over | 404 | 31.9 |

* Number of public school students, K-12

cation, including Trades and Industries and Industrial Arts, Homemaking, and other work related and career education subjects, including health occupations. The majority of respondents were involved in the traditional vocational areas of Business Education, Industrial Education, Vocational Agriculture, and Homemaking.

Vocational teachers generally have little or no background in their professional development that would aid them in better serving special needs students. Tables 5 and 6 show the amount of formal training acquired by vocational teachers that may be beneficial to their working with students with special needs.

It is obvious from the foregoing data that vocational teachers have, for the most part, little formal preparation for working with special needs students. Most have been exposed to the problems associated with teaching in the integrated setting only through the enrollment of special students in their classes. Table 7 shows the extent to which vocational teachers have experienced special needs students in their classes.

All vocational instructors in the secondary schools have not assumed the responsibility to serve special needs populations. Many times districts, schools, or teachers establish formal student entrance criteria to vocational subjects that tend to eliminate participation by special groups of students. Responses to the Iowa Survey indicate that 40 percent of the vocational teachers in this state have established such barriers to participation in their classes. Therefore, some question exists whether or not teachers are aware that the practice of requiring entrance criteria based on performance, cognitive, and personal characteristics of students may, in fact, be discriminatory. At the very least, such practices run contrary to the intent of both special education legislation and vocational special needs legislation, under which schools have the responsibility to teach students with special needs "in the least restrictive setting." That is to say that the first responsibility to those students is to place them in the "regular" classroom where feasible and appropriate, and to utilize special education and special needs funds to provide supplementary services so that their opportunity for success in that integrated setting is greatly increased. Consequently, some examination of entrance criteria appears to be in order. Additionally, the administration and supervision of vocational programs may need to be examined in relation to student opportunities. (See recommendation no. 6 at end of article.)

The question of whether or not a teacher takes steps to supplement and/or modify instructional procedures, curriculum, and the classroom environment to accommodate special students may well be one of

## TABLE 3
Number* of Iowa Survey Respondents by Subject Matter

| Subject | Number | % of Total |
|---|---|---|
| Business Education | 407 | 32.5 |
| Vocational Agriculture | 113 | 9.0 |
| Homemaking | 386 | 30.7 |
| Industrial Education | 339 | 27.0 |
| Other | 11 | .8 |

* Subject matter could not be determined in 9 cases.

## TABLE 4
Number of Iowa Survey Respondents by Years of Teaching Experience

| Years Experience | Number | % of Total |
|---|---|---|
| 1- 4 | 376 | 29.8 |
| 5- 9 | 314 | 24.9 |
| 10-14 | 220 | 17.5 |
| over 14 | 351 | 27.8 |

## TABLE 5
Iowa Survey Responses to the Item: "I Currently Hold a Degree or Teaching Certification in Special Education."

| | Number | Percent |
|---|---|---|
| Degree | 77 | 6.1 |
| Teaching Certification | 36 | 2.8 |
| Neither | 1097 | 86.7 |
| No Response | 55 | 4.4 |

## TABLE 6
Iowa Survey Responses to the Question: "What Formal Training Have You Completed in Teaching Special Needs Students?"

| | Number | Percent |
|---|---|---|
| None | 895 | 70.8 |
| Inservice Courses or Workshops | 183 | 14.5 |
| College Courses | 143 | 11.3 |
| Other | 13 | 1.0 |
| No Response | 31 | 2.4 |

**TABLE 7**

Iowa Survey Responses to the Question: "What Teaching Experience Have You Had with Special Needs Students?"

| | Number | Percent |
|---|---|---|
| None | 285 | 22.5 |
| Have taught special classes | 113 | 8.9 |
| Only in my regular classes | 827 | 65.4 |
| Other | 30 | 2.4 |
| No Response | 10 | .8 |

**TABLE 8**

Iowa Survey Responses to the Question: "Which of the Following Most Accurately Describes Your Feelings Regarding the Best Way to Provide Services to Disadvantaged and Handicapped Students in Secondary Vocational Education?"

| Attitude | All Teachers Responding |
|---|---|
| Every effort should be made to integrate them into "regular" classes | 31.8% |
| They should be taught in separate classes especially designed for their disadvantagement or handicap | 30.8% |
| I haven't any strong feelings either way | 23.8% |
| Other | 13.6% |

attitude. Overcoming the apprehensions, fears, and misunderstandings of what is required to teach a more diverse student population may be the first and most critical step toward a solution to the problem. Evidence gathered through the Iowa Survey indicates that approximately one-third of the state's vocational teachers were not for the concept of integrating, or mainstreaming, special needs students. Table 8 shows a breakdown of teachers' attitudes on the subject of integrating.

The "other" responses from Table 8 were almost always a vote for integrating with some qualification such as providing additional help to the teacher, providing special training for teachers, reducing student load, etc. It would appear, then, that up to about 70 percent of Iowa's vocational teachers would not necessarily be *against* mainstreaming special needs students. To comply with the mandates of the law, and with the best thinking in the field — thinking based on experimentation, research, and follow-up — inservice programs must be provided to help all vocational teachers understand how best to mainstream students using the support services they presently have available to them. Additionally, vocational teachers must be given the opportunity and support to develop alternative strategies for meeting the needs of that population of students. Such alternative strategies might include the development of separate or segregated classes for certain students if that were deemed the most appropriate method for addressing their unique learning problems.

## SERVICES AVAILABLE TO SPECIAL NEEDS STUDENTS

Vocational educators responding to the Iowa Survey indicated a relatively low degree of success in meeting the needs of special needs students in their classes.

### TABLE 9
### Iowa Survey Responses to: "To What Degree Do You Feel You Are Meeting the Vocational Needs of Disadvantaged and Handicapped Students in Your Classes Now?"

| Degree | Number | Percent |
|---|---|---|
| Very successfully | 95 | 7.5 |
| Succeeding with most, but not all | 755 | 59.7 |
| Failing with most, but not all | 231 | 18.3 |
| Not at all | 117 | 9.2 |
| No response | 67 | 5.3 |

According to the data in Table 9, close to 30 percent of the vocational teachers responding felt they were not being successful with special needs students. That information, together with the fact the 63 percent are only succeeding with "most" special needs students, points up the need for a major inservice effort to better equip vocational teachers to reach all their students.

Most teachers (86.8%) reported that there is a special education program in their school. Many special needs students are receiving special education services. However, the coordination of vocational and special education programs is left largely to chance.

The terms "special needs" and "special education" are viewed as synonomous by practitioners in the field. Consequently, teachers ignore the plight of special needs students on the rationale that special education will take care of the problem. Typically, special educators do not solicit the input of vocational educators while developing the Individualized Educational Plan (IEP). Thus, vocational personnel are not helped to better understand the special needs of students, nor are they involved in helping solve their problems. Additionally, special needs students are defined as those students *not succeeding* in a vocational program. As a rule, vocational educators do not seek the assistance of special educators to help solve *learning problems*. In most instances special education services are not for all, and are not provided because students are not labeled as "handicapped."

To correct the malady of how to utilize special needs resources at least two things need to happen: (1) all practicing educators need to be aware that special needs students are not necessarily special education students — they are students who for some reason or other are not succeeding in vocational classes, such lack of success being related to a disadvantagement or handicap — and (2) vocational educators and special educators must collaborate in planning for both special needs students and special education students so as to provide support services to those students so they can find success.

A surprisingly large number of respondents to the Iowa Survey were not aware of the various kinds of work-experience programs that might be available to their special needs students. However, there is evidence from the data in Table 10 that many students do have access to some type of work-experience program. Teachers should be made aware of the availability of those programs.

A variety of support services are available to special needs students. Table 11 outlines the support services respondents' indicated were available in their schools.

From the data in Tables 10 and 11, it is evident that many vocational instructors are not fully aware of services that may be available to special needs students. That knowledge in

## TABLE 10
Iowa Survey Responses to: "What Programs Are Available to the Special Needs Students You Teach?"

| Program | Yes | (%) | No | (%) | Don't Know | (%) |
|---|---|---|---|---|---|---|
| a. Work-Study (Spec.Ed.) | 649 | (56) | 316 | (27) | 194 | (17) |
| b. Employer School Program (ESP) | 331 | (30) | 392 | (36) | 379 | (34) |
| c. Summer Youth Employment | 390 | (35) | 282 | (26) | 429 | (39) |
| d. Any CETA Program | 224 | (21) | 332 | (31) | 526 | (48) |
| e. GYOP | 237 | (22) | 301 | (27) | 559 | (51) |
| f. OEO, or Community Action | 182 | (17) | 318 | (30) | 554 | (53) |

## TABLE 11
Iowa Survey Response to: "Which of the Following Support Services Are Readily Available to Special Needs Students in Your Classes?"

| Service | Yes | (%) | No | (%) | Don't Know | (%) |
|---|---|---|---|---|---|---|
| a. Tutors | 441 | (39) | 480 | (43) | 203 | (18) |
| b. Remedial instruction | 914 | (76) | 195 | (16) | 92 | ( 8) |
| c. Teacher aide(s) | 389 | (34) | 630 | (55) | 123 | (11) |
| d. Psychological testing/counseling | 1059 | (87) | 55 | ( 5) | 101 | ( 8) |
| e. Occupational testing/counseling | 841 | (71) | 117 | (10) | 233 | (19) |
| f. School year on-the-job training | 521 | (44) | 409 | (35) | 244 | (21) |
| g. After graduation placement services | 186 | (16) | 508 | (45) | 441 | (40) |
| h. Informal job placement during school year | 410 | (35) | 400 | (34) | 365 | (31) |

itself points up the need for inservice activities that will help make teachers aware of services they can utilize to meet the needs of a diverse population of students. Additionally, inservice activities should include referral methods and techniques teachers can incorporate as a part of their routine activities for helping students take advantage of supplementary services.

### CLASS ENROLLMENT DATA

Teachers were asked to give the enrollment figures for each of their vocational classes as of September 15, 1976. That date was used since it corresponds with the date schools use for reporting enrollments for the state aid formula, thus making the data readily available. Drops were to have been reported as of the date of completing the survey instrument, which may have interfered with receiving the best possible data in regard to drops. The data reported by teachers may reflect dropouts from courses during the second semester only. This is suspected since the survey was completed during the second semester, and the directions given in the survey instrument were misleading as to how to report the information. Therefore, this part of the data has some definite limitations. Conclusions stated concerning the dropout data are subject to cautious interpretation. First-semester-only courses were most likely not reported in any of the survey data obtained.

An additional problem with the use of the data regarding students who have been dropped from the vocational classes lies in the lack of any reason given for dropping those students. Gross figures dealing with the number of students dropped reveal nothing about whether or not that student actually dropped from

**TABLE 12**
Secondary Vocational Enrollments Reported on the Iowa Survey

| Grade | Male | Female | Total |
|---|---|---|---|
| 9 | 13,143 | 13,061 | 26,204 |
| 10 | 10,221 | 10,857 | 21,078 |
| 11 | 12,360 | 14,517 | 26,877 |
| 12 | 13,713 | 15,744 | 29,457 |
| TOTALS | 49,437 | 54,179 | 103,616 |

school, just dropped out of the vocational class, transferred to another class, or anything useful as to the disposition of the case. Hopefully, teachers responding to the survey interpreted the instruction to record drops in the conventional sense of "drops from school," or "from this class." If that were the case, one could assume with some confidence (from the data) that fairly large numbers of students seem to be leaving vocational classes before successful completion of those classes. That being the case, each of those students reported in the "dropped" column is potentially a special needs student.

Assuming that the Iowa Survey represents about 65 percent of the total population, there are approximately 160,000 student enrollments in secondary vocational classes. It should be pointed out that these data do not imply 160,000 different students. Teachers reported total numbers of students enrolled in each of their vocational classes. Undoubtedly, then, some students would be reported two or more times by a teacher who had that student in two or more different classes, or by more than one teacher responding to the survey from the same school. No data are available to determine the numbers of students counted more than once.

Table 13 shows numbers of students who were reported as having been dropped from vocational classes and the percent those figures represent of the data in Table 12.

The data in Table 13 have several limitations. No definition of a "drop" was given the survey respondents. Therefore, it is possible that these data include students who transferred from one class to another within a school. Also, they could include students who transferred to other schools or districts. The students reported in Table 13 are not necessarily "dropouts" in the conventional sense.

Even with those limitations in mind, there is cause for concern about the numbers of students who are reported as having been dropped from vocational classes. Historically, students drop out of school in larger proportions at the tenth and eleventh grades. Data collected in previous years indicates that composite dropout rates in Iowa's schools range from just over 2 percent in ninth grade to just under 6 percent in eleventh grade. The information in Table 13 indicates that students are leaving vocational education in larger proportions than they typically drop out of school. Of special concern are the rates at the ninth and twelfth grades, which are more than double the expected dropout rates. Considering the limitations of these data, perhaps the best that can be said is that the evidence exists to support a more thorough investigation of the student attrition rates in vocational education across the state. The other extreme — assuming that the data are reliable — is that there is a serious problem in relation to student retention in vocational education.

Considering the limitations on this class enrollment data described ear-

## TABLE 13

Secondary Vocational Students Reported as Having Been Dropped from Vocational Classes on the Iowa Survey

| Grade | Male | % | Female | % | Total | % |
|---|---|---|---|---|---|---|
| 9 | 763 | 5.8 | 632 | 4.8 | 1,395 | 5.3 |
| 10 | 894 | 8.7 | 831 | 7.7 | 1,725 | 8.2 |
| 11 | 960 | 7.7 | 1,283 | 8.8 | 2,243 | 8.3 |
| 12 | 1,415 | 10.3 | 1,595 | 10.1 | 3,010 | 10.2 |
| TOTALS | 4,032 | 8.2 | 4,341 | 8.0 | 8,373 | 8.1 |

## TABLE 14

Special Needs Students in Vocational Classes as Reported by Iowa Survey Respondents

| | Male | | | Female | | | |
|---|---|---|---|---|---|---|---|
| | H* | D** | Total | H* | D** | Total | Row Total |
| 9 | 420 | 630 | 1,050 | 275 | 479 | 754 | 1,803 |
| 10 | 269 | 514 | 783 | 217 | 434 | 651 | 1,434 |
| 11 | 228 | 490 | 718 | 168 | 463 | 631 | 1,349 |
| 12 | 242 | 434 | 676 | 175 | 381 | 556 | 1,232 |
| TOTALS | 1,159 | 2,068 | 3,227 | 835 | 1,757 | 2,592 | 5,819 |
| | | | | | | | (Est. 100%: 8,952) |

* H = Handicapped
** D = Disadvantaged

lier, the nearly 9,000 special needs students reported in Table 14 is only a gross estimate. (The 9,000 figure is based on the assumption that the 5,819 students actually reported represent only 65 percent of the total population.) The evidence does suggest, however, that vocational teachers do recognize that special needs students are, in fact, enrolled in their classes.

## IDENTIFICATION OF INSTRUCTIONAL PROBLEM AREAS

Teachers were asked to indicate, from a list of 58 potential problems, the areas which prevented them from being successful with special needs students in their classes. Table 15 illustrates the student-related problem areas as perceived by the teachers.

Over 70 percent of the respondents indicated that low reading and math ability were the two problems they have in attempting to serve these students. The "apathy toward school" problem of disadvantaged students was mentioned by 67 percent of the respondents, while 59 percent cited poor job-task skills by handicapped students as a problem. Otherwise, the problems in Table 15 were all within the 40-55 percent range. Note that teachers did not attribute any problems specifically to handicapped students. Seven of the 10 problems were attributed solely to disadvantaged students. Conventional wisdom dictates that there is probably a relationship between some, if not all, of those seven problems and the two problems mentioned by the greater number of respondents — low reading and math ability.

**TABLE 15**

Student-Related Problems in Serving Special Needs Students as Reported by 40% or More of the Respondents to the Iowa Survey

| | | |
|---|---|---|
| 1. | Poor Attendance | D |
| 2. | Poor Interpersonal Skills | B |
| 3. | Cannot/does not accept responsibility | D |
| 4. | Poor job-task (performance) skills | B |
| 5. | Motivational Problems | D |
| 6. | Are apathetic toward school in general | D |
| 7. | Low reading ability | B |
| 8. | Low math ability | B |
| 9. | Educational problems are primarily a result of home environment | D |
| 10. | Career goals are not well established | D |

H = Characteristic of Handicapped Students
D = Characteristic of Disadvantaged Students
B = Characteristic of Both Handicapped and Disadvantaged Students

**TABLE 16**

Teacher-Related Problems in Serving Special Needs Students as Reported by 40% or More of Iowa Survey Respondents

| | | |
|---|---|---|
| 1. | No training in identifying special needs students | B |
| 2. | Not adequately trained to deal with them, once identified | B |
| 3. | Do not have extra paid time to develop activities for them | B |
| 4. | Do not have released time | B |
| 5. | No inservice available | B |
| 6. | Student load too great | B |

B = Both Handicapped and Disadvantaged

Table 16 shows the problems unique to the teacher in dealing with special needs students.

Teacher concerns seem to focus on the need for more adequate training and more acceptable working conditions to serve students more effectively. The next section attempts to delineate some potential solutions to the problems identified in Tables 15 and 16.

## IDENTIFICATION OF SOLUTIONS

Teachers were asked to rank potential solutions to the problems they encounter in working with special needs students in the integrated setting. Table 17 shows the rankings they gave to five different solutions.

Clearly, teachers see the need for appropriate inservice training if they are to better serve special needs students in their classes. If inservice is to be provided, they would place the highest priority on activities that would help them diagnose individual student needs. Next, they would choose activities to help them do a better job individualizing instruction to accommodate the diverse needs of students. Table 18 illustrates the priority rankings given inservice activities.

The rankings given in Table 18 are not surprising when placed in the context of the learning continuum (i.e., diagnosis-prescription-evaluation). It would appear that teachers feel the need to determine student problems before they can set about to remediate them.

The data in Tables 19 and 20 deal with the provision of resources to help teachers and districts finance various modifications to existing programs to better serve special needs students.

## TABLE 17
Rankings Given Five Potential Solutions to Problems in Working with Special Needs Students by Iowa Survey Respondents

| Rank | Item | No. Times Ranked "1" | Mean Ranking | Median Ranking |
|---|---|---|---|---|
| 1 | Additional inservice training | 433 | 2.506 | 2.218 |
| 2 | Additional manpower (aides, tutors, teachers, counselors, etc.) | 331 | 2.737 | 2.687 |
| 3 | Additional planning time | 177 | 2.902 | 2.783 |
| 4 | Additional equipment, supplies, space | 184 | 3.312 | 3.497 |
| 5 | Consultative services | 69 | 3.485 | 3.601 |

## TABLE 18
Rank-Order of Inservice Activities by Iowa Survey Respondents

| Rank | Item | No. Times Ranked "1" | Mean Ranking | Median Ranking |
|---|---|---|---|---|
| 1 | Activities involving diagnosing individual student needs | 509 | 2.051 | 1.753 |
| 2 | Activities involving individualizing instruction | 345 | 2.415 | 2.190 |
| 3 | Activities involving student evaluation | 91 | 3.102 | 3.105 |
| 4 | Activities involving the use of special equipment, supplies, and space needs for special needs students | 191 | 3.254 | 3.498 |
| 5 | Activities involving job placement | 59 | 4.078 | 4.504 |

## TABLE 19
Ranking of In-Class Services that Would Help Teachers Better Serve Special Needs Students

| Rank | Item | No. Times Ranked "1" | Mean Ranking | Median Ranking |
|---|---|---|---|---|
| 1 | Teacher aide(s) | 470 | 1.790 | 1.736 |
| 2 | Teacher(s) | 452 | 2.050 | 2.113 |
| 3 | Tutor(s) | 245 | 2.183 | 2.223 |

## TABLE 20
Ranking of Out-of-Class Services that Would Help Teachers Better Serve Special Needs Students

| Rank | Item | No. Times Ranked "1" | Mean Ranking | Median Ranking |
|---|---|---|---|---|
| 1 | Special teachers-remedial | 405 | 2.216 | 2.010 |
| 2 | Special teachers-vocational | 363 | 2.373 | 2.146 |
| 3 | Job development, placement, work-experience | 217 | 3.232 | 3.463 |
| 4 | Tutor(s) | 133 | 3.405 | 3.475 |
| 5 | Additional counseling services | 68 | 3.670 | 3.855 |

## TABLE 21

### Rankings Given Sources of Consultative Help for Information and Strategies for Serving Special Needs Students

| Rank | Item | No. Times Ranked "1" | Mean Ranking | Median Ranking |
|---|---|---|---|---|
| 1 | Skilled staff persons within my school district | 430 | 2.267 | 1.835 |
| 2 | No preference, as long as the person was qualified | 460 | 2.852 | 2.043 |
| 3 | Area Education Agency | 158 | 2.932 | 2.767 |
| 4 | College or University | 51 | 4.160 | 4.368 |
| 5 | State Dept. of Public Instruction | 37 | 4.211 | 4.374 |
| 6 | Another School District(s) | 22 | 4.300 | 4.409 |

Teachers were in favor of utilizing skilled staff persons within their own school district to help in the development of activities to serve special needs students. Any qualified person ranked second among the choices. Table 21 shows the rankings given the six sources of consultative help.

The rankings in Table 21 definitely validate acceptance of a local staff person as a primary resource for inservice. Clearly, local staff should be considered when choosing trainers for other teachers.

## SUMMARY

The Iowa Vocational Education/Special Needs Assessment project was an attempt to obtain data directly from vocational teachers concerning their classroom experiences with special needs students. Through the first mailing of survey instruments a 65 percent return was obtained. Responses came from a wide representation of vocational teachers in the state. Adequate numbers of beginning and experienced teachers, those teaching in various sized schools, and teachers in all levels and areas of subject matter responded to the survey. Teachers representing over 100,000 students supplied information about their classroom dropout rates and numbers of students they perceived as being disadvantaged and handicapped. They reported an 8 percent dropout rate, overall, and indicated that 9 percent of the total vocational enrollment were special needs students.

Respondents were frank in admitting their lack of success in serving special needs students. Thirty percent said they were either failing with most special needs students or were failing with all of them. Thirty percent also indicated that they thought special needs students should not be integrated into regular classes. Thirty-two percent said they should be integrated, and the balance did not have a definite opinion on the subject.

Surprisingly large numbers of vocational teachers were not aware of the various career exploration and work-experience programs that might be available to special needs students in their schools, districts, or community. A relatively high level of academic and counseling support services was indicated.

Teachers pointed to a number of problem areas they encounter when serving disadvantaged and handicapped students. Those mentioned most frequently were low reading and math ability of both populations. Other problems attributed to both handicapped and disadvantaged students included poor interpersonal skills and poor work skills. In addition, disadvantaged students were characterized as having poor attendance, not being able to accept responsibility, not being motivated, being apathetic toward school, not having career goals, and having educational problems as a result of poor home environments.

In looking at their own situation, teachers identified the need for more training to recognize and deal with special needs students. They indicated a need for more inservice and time to get involved in it. They also mentioned the problem of too large a student load to adequately deal with the individual needs of special students.

As for solutions to the problem, teachers identified inservice training as the number one need. Aides, tutors, and additional manpower was their second choice of potential solutions. Additional planning time was ranked third. Choosing from a list of possible inservice activities, teachers picked those involving diagnosing individual student needs as their first choice, followed by activities for individualizing instruction and activities involving evaluation. Concerning the type of inservice they would choose, teachers selected how-to-do-it exercises. In rating the use of additional manpower as a solution to the problem, teachers indicated a need for teacher aides, followed by additional teachers. For out-of-class manpower services, they were in favor of special remedial teachers and special vocational teachers.

## RECOMMENDATIONS

1. A follow-up survey should be conducted at the secondary level. This survey should be designed to answer some of the questions raised by the present survey data. For instance, the present data would indicate that there is a problem with students dropping out of vocational classes. A closer analysis of that possibility is in order. Additionally, it should be determined whether or not those dropouts involve special needs students in larger numbers than are found in the general population.

The present data would also indicate that the special needs population represents about 9 percent of the total vocational population. A carefully designed follow-up survey could determine the exact ratio and total population, thus providing a better input of data for more equitable distribution of resources. Another purpose that a follow-up survey would serve is to obtain more definitive data on the broad range of services, both school sponsored and community sponsored, available to special needs students.

It is recommended that the follow-up survey involve a random sample of no more than 10 schools in the state representing several strata of programming. Those strata should include district size (five categories), number of state-reimbursed programs (three strata), number of special needs students by percent of population (two or three strata), and district per capita wealth (two or three strata). Other strata may be necessary. An in-depth investigation of each subject school involving the collection of data on identified staff persons, classes, special needs students, supplementary programs, and fiscal resources should then be conducted. The case study approach may be appropriate in such a study.

2. A dissemination system needs to be developed that will constantly make administrators, teachers, counselors and other educational personnel aware of the rules and regulations regarding the provision of services to special needs students. Such information should include clarification of definitions and categories, types of services required and available, and methods of delivering appropriate services.

3. Inservice activities should be provided to persons interested in increasing the level of services being provided to vocational special needs students. They should include *awareness* activities for all levels of educational personnel, including college

and university, DPI, Area Community College, Area Education Agency, and local school district. Inservice activities for teachers should include how-to-do-it exercises for identifying and assessing special needs students, developing individualized instruction, monitoring and evaluating student progress, and conducting follow-up.

In developing inservice programs for local districts the interdisciplinary approach should be stressed. That approach includes the development of Individual Vocational Plans (IVP's) utilizing input from administration, counselors, special education and vocational education personnel. Additionally, inservice should be developed involving the best use of trainers from higher education, DPI, Area Community Colleges, and the A.E.A.'s.

4. Inservice for local teachers, counselors, and administrators should include presentations by and observation of innovative vocational special needs programs over the state.

5. Inservice activities should also emphasize the use of innovative curriculum materials, designed especially for this population. There is currently a wide selection of materials available to aid teachers in the identification, assessment, instructional, and evaluation processes. Most are easily adopted to the differing local situations. Instruction in the use of these materials (how-to-do-it) is an essential ingredient in any vocational special needs inservice effort.

6. Entrance criteria for participation in many vocational preparatory courses at the secondary level should be investigated. It has been a long-standing policy of many schools to establish fairly stringent selective criteria for students who wish to participate in cooperative work-experience programs (Distributive Education, Trades and Industries Coop, Office Coop, etc.). That practice may n[illegible] be allowable under recent laws. [illegible]eps need to be taken to insure that all students have equal access to such programs.

7. A final recommendation, not specifically related to special needs, deals with the accessibility of data on educational personnel in the field. In the case of this survey, the best list of vocational teachers obtainable included nearly 2,000 names of persons not actively teaching vocational subjects. For research purposes and for a variety of other reasons a data collection system should be devised that would better delineate only those persons actually involved in specific educational activities in local and area educational agencies.

# Assessment of the Prevalence and Service Need Requirements of Handicapped and Disadvantaged Students in Vocational-Technical Education Programs in Minnesota

GERALD R. SCHNECK
University of Wisconsin-Stout
LOWELL P. LERWICK and
GEORGE H. COPA
University of Minnesota

In action by the 1977 session of the Minnesota Legislature, the 1977 Omnibus School Aids Bill (House File 550 or Chapter 447, Article 4, Section 18) contained the following charge:

> The State Board of Education shall conduct a state-wide needs assessment for the purpose of determining future program needs for services to handicapped or disadvantaged students in vocational-technical education. Information for this needs assessment shall include data collected by the Division of Special and Compensatory Education and the Division of Vocational-Technical Education concerning the vocational training needs of handicapped and disadvantaged students. The result of this assessment shall be reported to the State Legislature by February, 1978. The sum of $15,000 is appropriated from the General Fund to the Department of Education for the purposes of this section, to be made available until March 1, 1978.

This legislative charge was determined by the Minnesota State Department of Education to be a joint responsibility of both its Division of Special and Compensatory Education and Division of Vocational-Technical Education. These agencies were viewed as the major sources of information about handicapped and disadvantaged persons in vocational-technical education in Minnesota and also in the best position to make recommendations about the means and resources requirements to improve services to these persons. The study described in this article was commissioned to provide informational input to the recommendation development process used by the above-mentioned agencies.

## PURPOSE

This study focuses on providing the best possible description of the *present* (as opposed to past or future) need for services by handicapped or disadvantaged persons who want and could benefit from vocational-technical education in Minnesota. The words "best possible" mean what is *possible* given existing data and the time and financial resources available to conduct the study. The words "want and could benefit" mean the study is not limited to only those presently enrolled in vocational-technical education programs, but also includes those additional persons who might enroll if they were provided the needed special services. Since it is focused on the *present*, the data reported are largely cross-sectional rather than longitudinal which would provide a trend over time. The decision to focus on the present was made at the time the study proposal was developed and reviewed; focus on the present was rationalized at

---

GERALD R. SCHNECK is with the University of Wisconsin-Stout, Menomonie, Wisconsin. LOWELL P. LERWICK and GEORGE H. COPA are with the University of Minnesota, Minneapolis, Minnesota.

this time by questions concerning the availability of both historic or future data and the high priority given to obtaining a good description of "what is" as a base point for future planning.

Specifically, the study objectives were:

1. To operationally define and specify the criteria by which to identify persons who are handicapped and disadvantaged.
2. To estimate the prevalence of persons who are handicapped and/or disadvantaged, in terms of number and percentage of the total population.
3. To list and describe the present services being provided to meet the needs of handicapped and disadvantaged students in vocational-technical education.
4. To identify the sources and relative allocations of present State and Federal funds for services to handicapped and disadvantaged students in vocational-technical education.

## STAFF AND RESOURCES

The study was conducted during the three-month period of October 13, 1977, to January 16, 1978. In addition to the director, the project employed a staff of one Research Fellow, one Project Assistant and one secretary.

A Steering Committee was used to provide guidance in carrying out the objectives of the study in an efficient manner. The 11-member committee was composed of representatives of the following organizations:

Minnesota State Department of Education:
  Division of Special and Compensatory Education
  Division of Vocational-Technical Education

Local Educational Agencies (two)

Consumer Organizations:
  Minnesota Association of Children with Learning Disabilities

Minnesota Research and Development Center for Vocational Education (University of Minnesota)

The Committee met five times during the three-month duration of the study.

## PROCEDURES

Due to the time and financial constraints, as well as concern for avoidance of duplicated data collection, the study was conducted using secondary (i.e., existing) sources of data rather than concentrating on actual collection of primary or new, first-hand information. Investigation of secondary data sources was conducted through interview with individuals knowledgeable about the collection and analysis of relevant existing data. Data available at each secondary source was used either directly or after additional manipulation as needed to meet the purposes of the study. The compatibility of information collected from various sources was investigated in order to portray the extent and limitations of existing data collection and analysis procedures. In addition, the information collected will facilitate improvement of the data sources. The most current information available from each source was used.

The study was conducted as a series of activities which necessarily overlapped in time and focus. The activities were as follows:

1. Identify definitions of "handicapped" and "disadvantaged" and "special services" used by Federal and Minnesota agencies.
2. Select indicators of "handicapped" and "disadvantaged" conditions for which data were available in Minnesota.
3. Identify and investigate secondary data sources to describe the prevalence of, services to and funding for handicapped and disadvantaged persons who want and could benefit from vocational-technical education. Sources investigated include:

- U.S. Department of Commerce,

180

Bureau of the Census, 1970 Census of Population

- U.S. Office of Education, Bureau of Education for the Handicapped
- U.S. National Center for Educational Statistics
- Minnesota Department of Education
  - Division of Special and Compensatory Education
  - Division of Vocational/Technical Education
    - — Special Needs Vocational Programs
    - — Program Planning and Development Section
  - State Aids, Statistics and Research Section
  - Division of Planning and Development
  - Professional Staff Library
- Minnesota Department of Economic Security
  - Division of Vocational Rehabilitation
  - Division of Employment Services
  - Minnesota Governor's Manpower Office
- Minnesota State Planning Agency
  - Office of the State Demographer
  - Developmental Disabilities Section
- Minnesota Department of Public Health
- Minnesota Department of Public Welfare
- Minnesota Association of Retarded Citizens
- Minnesota Governor's Council for the Handicapped
- Minnesota Department of Corrections
- Minnesota Educational Computer Consortium (MECC)
- University of Minnesota
  - Department of Vocational and Technical Education
  - Special Education Program, Department of Psychoeducational Studies
  - Minnesota Analysis and Planning System (MAPS)
  - Department of Physical and Rehabilitation Medicine
  - Vocational Psychology Research, Department of Psychology
  - Adult Basic Education Program (ABE)
- Rehabilitation Counseling Program, Department of Guidance and Counseling, St. Cloud State University
- Total Information Education System (TIES) (Minnesota)
- Rehabilitation Research and Training Center, University of Wisconsin-Stout
- Hennepin County Court Services (Minnesota)
- Secondary Alienated Youth Alternative Education Programs Project, Clearinghouse and Training Center (Minnesota)
- CETA — Region III Evaluation Center (Minnesota)
- Northwest Regional Foundation (Minnesota)
- Multi-Resources Center, Inc. (Minnesota)
- North Hennepin Planning Project (Minnesota)
- Special Needs Coordinators, Detroit Lakes and Minneapolis Area Vocational-Technical Institutes (AVTI's) (Minnesota)

A more detailed listing of sources and specific persons contacted is provided in Appendix I of the Final Report.

4. Develop estimates of the prevalence of handicapped and disadvantaged persons in Minnesota, particularly those who want and could benefit from vocational-technical education.

5. Describe the services presently available for handicapped and disadvantaged persons in vocational-technical education programs in Minnesota.

6. Describe the funding sources and amounts expended for services to handicapped and disadvantaged persons in vocational-technical education programs in Minnesota.

7. Determine the assumptions and limitations of secondary data used to describe prevalence of and services and funding for handicapped and disadvantaged persons.

8. Write and disseminate a full study report and executive summary. A time schedule of activities is shown in Appendix II of the Final Report.

## CONCLUSIONS

Investigation of data and information surrounding each of the objectives of the study, resulted in a number of conclusions specific to each. A detailed explanation of how these conclusions were reached is described in the Final Report of this study. Conclusions for each study objective are as follows:

1. To operationally define and specify the criteria by which to identify persons who are handicapped and disadvantaged.

- The likely overlap between special education and special needs vocational education is for handicapped persons in grades nine to twelve.
- Definitions and indicators are more specific and consistent across levels of government and agencies within levels for handicapped than for disadvantaged persons.
- Both handicapped and disadvantaged persons can be identified in terms of causal and effect (functional) characteristics. The use of effect (functional) characteristics seems of most concern to vocational education.
- Using the effect or functional method to define handicapped or disadvantaged persons requires that the situation or environment within which the person is to function be considered.
- Considerable variation in expertise, information and technology is needed to identify persons using various indicators of handicapped and disadvantaged conditions.
- There are a large number of different types of services which are needed to remediate the effects of handicapped and disadvantaged persons.
- Persons may have more than one handicapping condition or may be both handicapped and disadvantaged.
- The validity or fairness of indicators of handicapped or disadvantaged conditions can change with age (e.g., unemployment is not a useful indicator for those in school, lack of educational achievement may not be a useful indicator for adults).

2. To estimate the prevalence of persons who are handicapped and/or disadvantaged, in terms of number and percentage of the total population.

- Prevalency estimates available for Minnesota in terms of proportion and number have marginal accuracy and completeness at this time. An exception is the prevalency estimates for the functionally disabled currently being developed from a study by the Minnesota Division of Vocational Rehabilitation.
- Both definition and method of assessment problems are hindering the development of better prevalency estimates.
- Using broad functional definition of the disabled, approximately 14 percent of Minnesota's population is disabled.
- Considering the whole age range of the population, the rank order of prevalence for broad functional disability indicators is: physical disability (by far the highest), hearing, blindness and vision, developmental disability (includes mentally retarded, cerebral palsied, epilepsy, dyslexia and autism), mental illness, speech, and chemical dependency.
- Reading below success level is the most prevalent disadvantagement indicator for secondary and post-secondary education-age groups.
- There is likely a higher prevalence rate of academically disadvantaged students in secondary vocational education programs than in the total secondary school population.
- There is likely a higher prevalence rate of academically and economically disadvantaged students in post-secondary vocational education programs than in other types of post-secondary education.
- There are several reasons that are likely to keep a person from enrolling in an additional job-related training program for those 16 years of

age and older who are interested in such training. They are in order from highest to lowest: cost of program, work takes too much time, lack of information, family obligation (these last three are essentially at the same prevalency rate), and transportation problems.

- There are a number of self-perceived characteristics which might cause hesitation to attend additional job-related training for persons 16 years of age and older who are interested in such training. The prevalency ranges from approximately two to four percent in preliminary estimates for: reading difficulty, physically handicapped, hard of hearing, writing difficulty, and arithmetic skills.

3. To list and describe the present services being provided to meet the needs of handicapped and disadvantaged students in vocational-technical education.

- Many agencies, groups and individuals are involved in providing services. Documentation of services provided across and within service sources, and subsequent detailed analysis for disclosure of extent, duplication and gaps was not totally possible with the data that was identified.
- Organizational units have been developed within the Department of Education to serve handicapped and disadvantaged persons in vocational education. These units have attempted a self-assessment to identify how they fit together.
- Economically disadvantaged persons needing vocational education can receive a wealth of services through CETA programs.
- An unidentifiable group of secondary vocational education students who are handicapped and disadvantaged are being served through regular vocational education programs via the concept of "mainstreaming" without support services. The identifiable portion of special needs vocational education persons at the secondary level are in segregated classes. When comparing education levels, these secondary students are the largest group served through Special Needs Vocational Programs.
- Approximately one-third of post-secondary vocational education students are handicapped or disadvantaged with the ration being approximately one to three, respectively. Handicapped students are using about twice as many annual hours of service time per person as disadvantaged persons. There is considerable variance in time used between different handicaps and disadvantages and between different types of services to these two groups.
- Special needs vocational education for adults is very limited in scope and number served.
- The Special Needs Assessment Project (SNAP) has the potential to provide the beginnings of a management information system (MIS) for special needs vocational education service at the post-secondary level. Its effectiveness is limited by lack of mandatory data submission by each AVTI and adequate means to process and monitor data analysis and report generation. Once it is effectively interfaced with the operations of the Minnesota Post-Secondary Follow-Up System, it will be possible to determine outcomes in terms of job placement and activity on nearly all program leavers (completers and drop-outs).
- Handicapping conditions tended to signify more definite and specific vocational program and special service needs than disadvantaged conditions.
- More severe handicapping conditions tended to need more different types of special services.
- Nearly all categories of vocational programs and services used in the survey were identified as potential needs for all of the handicapping conditions listed.

- A significant number of direct and non-direct educational support services, which fall outside of present special needs vocational education service categories, were identified as necessary to the success of handicapped students in vocational education programs.
- Disadvantaging conditions tended to indicate a wide range of potential vocational program and service needs. In general, fewer programs and services were judged as probably being needed when compared to results for the handicapped.
- Indicators of the disadvantaged appeared to provide limited utility in determination of special vocational needs of disadvantaged persons.
- Indicators used to identify disadvantaging conditions did not reveal other direct or non-direct education support services that would further enhance success in vocational training programs.
- Special education support services in regular vocational education programs tended to be needed more than special instruction programs in meeting the vocational needs of disadvantaged persons.
- A more extensive investigation of the vocational program and support service needs of handicapped and disadvantaged persons is necessary to determine both present and future needs. Consideration as to the scope and extent of services would be necessary to more adequately represent all parameters of service need requirements for decision-making.

4. To identify the sources and relative allocations of present State and Federal funds for services to handicapped and disadvantaged students in vocational-technical education.

- Tracing of the flow of funds between and within some agencies is not possible given constraints of the varieties of definitions, program delivery, and methods of data collection and analysis adhered to by the many human service agencies involved.
- The *Division of Special and Compensatory Education* will serve nearly 90,000 (duplicated count) handicapped persons age 4 to 21, or until completion of a secondary program, during FY 78.
  - —The total agency budget amounts to approximately $110,000,000 for FY 78.
  - —Programs and services are financed within public schools, State operated hospitals and special schools, correctional facilities and for high-priority or low-incidence groups of handicapped.
  - —In-service training of administrative and classroom instructors is also a significant portion of their operations.
  - —Funding sources for FY 78 appears to be 7 percent Federal, 61 percent State, and 32 percent local.
  - —Allocations to the Division of Vocational-Technical Education are made to aid in the cost of personnel salaries of secondary level special needs positions which are used to support vocational aspects of the Special Education program. Reimbursement is made for fully certified personnel only.
- The *Division of Vocational Rehabilitation* estimates serving 37,000 handicapped clients of employable age during FY 77. Of this number, about 17,000 needed outlay of funds for services or in direct support of individuals.
  - —Total agency funding is from 80 percent Federal and 20 percent State sources.
  - —The total agency budget amounts to about $14,000,000 for FY 77, of which $8,200,000 is in direct support of individual clients.
  - —Training is a vital remediation technique utilized by the agency to the extent of using 66 percent

of direct client services funds (37 percent of the total agency budget).

- During FY 77, 9,214 clients or 25 percent of total served by the agency were involved in training activities.
- During FY 77, 2,182 clients were involved in vocational education programs with supportive services and funds from the Division of Vocational Rehabilitation. This accounts for 6 percent of the total service population of the agency.
- The 2,182 clients receiving vocational education supportive services and funds during FY 77 used $709,388 or 5 percent of the total agency budget. This amounts to 13 percent of the training funds used.

- *Comprehensive Employment and Training Act (CETA) Youth Employment and Demonstration Projects Act (YEDPA)*
  - CETA estimated serving 70,409 persons during FY 77, of which 35,909 (51 percent) were unemployed youths.
  - Total CETA funding was from Federal sources and amounted to approximately $226,600,000 in FY 77.
  - The CETA program is aimed at unemployed/underemployed persons.
  - CETA funding is permissive, within Title guidelines, to the degree of determining how programs and services are implemented, being placed with each of 10 prime sponsors in the State of Minnesota.
  - CETA authorizes public service employment, development of new employment positions, vocational training, planning, and other activities.
  - YEDPA program is a newly funded program (FY 78) for serving unemployed and underemployed youth. A minimum of $8,400,000 is to be allocated to the State for this program during the year. No estimates of total participation were available.
  - YEDPA authorizes creation of employment positions, vocational training, program planning, and other efforts directed toward promotion of vocational skill training and employment of these youths.
- *Division of Vocational-Technical Education*
  - Total agency budget for FY 77 was about $176,500,000 from 6 percent Federal, 55 percent State, 30 percent local, and 9 percent other sources.
  - It is estimated that 26,000 handicapped and disadvantaged students were participating in Special Needs Vocational Programs funded programs and services during FY 77. This amounts to about 6 percent of those enrolled in reimbursed vocational education programs in the State.
  - Special Needs Vocational Programs were financed (at approximately $11,600,000 during FY 77) through 24 percent Federal, 30 percent State, and 46 percent local sources. Approximately $1,400,000 of this budget was a transfer from the Division of Special and Compensatory Education.
  - Special Needs Vocational Programs were used to finance services at 74 percent secondary, 24 percent post-secondary, and 2 percent adult levels, during FY 77.
  - Costs and expenditures for handicapped and disadvantaged students participating in regular vocational programs (mainstreamed) or special vocational instruction programs paid for through regular vocational education aids are largely not recorded, in an identifiable way at present.
  - Although local contribution is used to match with State funds

to gain use of Federal funds, the management and monitoring of actual use is controlled by the local agency and not the Division of Vocational-Technical Education.

After reviewing each objective and corresponding outcomes, the following summary conclusions appear warranted about the original proposal for the study and results of the study:

About the Study proposal —

- Ambitious, given time and resource constraints.
- Over-estimate of immediate availability and completeness of secondary data sources.
- Agency personnel were as cooperative as possible, given the limitations enforced upon the study.
- Under-estimated the complexity of selecting indicators of handicapping and disadvantaging conditions.
- Under-estimated the complexity of describing programs and services provided or which could be provided by the various human service agencies.

Results of the Study —

- Definitions and guidelines for identifying the handicapped are further developed than those for the disadvantaged.
- Both causal and functional definitions are necessary for the handicapped and disadvantaged. Causal definitions are needed for accountability and functional definitions to plan special services.
- There is a strong need for individual assessment, once definition and indicator issues are resolved, to determine:

  (1) eligibility of persons for services; and (2) to determine the complete education services necessary to allow the person to succeed in a vocational program.
- Using present indicators, there appears to be a greater number of disadvantaged persons than handicapped persons.
- Vocational education is serving a relatively large number of persons who are disadvantaged.
- Within vocational education, adult level handicapped and disadvantaged persons are served minimally in comparison to other education levels and the total prevalence within this age group (age 26+).
- There is a large number of agencies involved in providing services to handicapped and/or disadvantaged persons in vocational education. There is a strong need for coordination of definitions and management information within and between these agencies. Consistent program and service terminology is needed. The management information systems need strict compliance in data input and monitoring of analysis and output.
- In general, handicapped and disadvantaged persons tend to be dealt with by separate agencies based on eligibility requirements, except for the Special Needs Vocational Programs which deal with both groups.

# Synthesis

## THE FOUR STUDIES

The four studies selected for review contained a number of common variables relative to serving special needs students in vocational education. All four studies contained recommendations for state-level and local initiatives to improve vocational education efforts on behalf of special populations. The following sections describe and synthesize the major findings from these studies.

### Students Served

The two national studies by the Olympus Research Corporation examined programs for the handicapped (1974) and disadvantaged (1976) separately. The handicapped study noted that the vast majority of students served were classified as "mentally retarded" (77%), with 12% of these being "trainable mentally retarded." Fifteen percent of the students served in the programs studied were physically handicapped.

One of the major problems noted in the national disadvantaged study conducted by Olympus was the ambiguity in identification of the students to be served. Few states or communities had established specific eligibility criteria that went beyond the general Federal guidelines. Approximately half of the 84 project directors interviewed did not believe that the students enrolled were disadvantaged. For those students that were being served, the most common criterion used for identification was academic deficiency, that is, students who were one or more grade levels behind their peers. Slightly less than half of the disadvantaged students studied were minorities.

The Iowa study reported that there were approximately 9,000 handicapped and disadvantaged students enrolled in vocational education programs in Iowa. Of these, 65.7% were identified as disadvantaged; 55.4% were male. Data were not reported by specific handicapping condition or disadvantagement. However, the most frequently cited student problems for both handicapped and disadvantaged students were: poor interpersonal skills, low reading and math abilities, and poor job-task (performance) skills.

The Minnesota study used secondary data sources to examine the prevalence of special needs populations in the state. Using a broad functional definition of disability, it was reported that approximately 14% of the Minnesota population is disabled with physical handicaps the most prevalent (by far). Reading below grade level is the most prevalent disadvantagement indicator for secondary and post-secondary age groups. They also reported a higher prevalence rate of academically disadvantaged students in secondary vocational education programs than in the total secondary school population. Further, the researchers reported the strong likelihood of a higher prevalency rate of academically and economically disadvantaged students in post-secondary vocational education than in other types of post-secondary education programs.

In Minnesota, approximately one-third of all post-secondary vocational education students are handicapped or disadvantaged with approximately 75% of this group being disadvantaged. It was also noted in the Minnesota study that vocational education programs and services for adults with special needs are extremely limited.

As the awareness of educators increases relative to P.L. 94-142 and other civil rights legislation, a growing percentage of the students being served in vocational education are identified as students with special needs. To accommodate these students, efforts will be needed to modify regular vocational education programs to meet the occupational needs and learning styles of the individual. In some instances, special or separate vocational programs will continue to be required to serve students with severe problems or difficulties.

### Program Environments

Special needs students are typically served in a range of different environments or types of programs. A basic legislative mandate and related issue focuses upon the degree of mainstreaming which is occurring in vocational education.

The Olympus disadvantaged study found that two out of every three disadvantaged students (approximately 65%) at both the secondary and post-secondary level were in regular classes. The Olympus handicapped study revealed that 70% of the 92 programs studied provided for separate, special vocational programs for the handicapped students. The Minnesota study revealed that the "identifiable" portion of special needs vocational education students at the secondary level are in segregated classes. However, it was also noted that an unidentifiable group of secondary vocational education students who are handicapped and disadvantaged are being served through regular vocational education programs via mainstreaming. One of the major reasons cited in the studies for the use of special classes was the ease of fiscal accountability that a special class arrangement provides.

### Occupational Programs

The specific types of vocational programs which are provided for special needs students have been a continuing concern. The studies reveal that a large percentage of the programs focus on nonskills courses, e.g., remedial or prevocational education, world-of-work instruction. The Olympus disadvantaged study revealed that 69% of the secondary students and 56% of the post-secondary students were *not* enrolled in skills training programs. The Olympus handicapped study found that 63% of the students were in nonskills programs. Of these students, 52% were enrolled in prevocational programs. The balance was in programs for vocational evaluation, mobility instruction, travel training, sheltered workshops, and tutoring.

Those special needs students who were enrolled in vocational education skill training programs tended to be clustered in specific occupational areas. The Olympus handicapped study found the largest numbers of students in trade and industrial education classes (primarily male) and home economics (primarily female). The range of training enrollments was considerably wider for men than women. The Olympus disadvantaged study revealed a disproportionate number of students enrolled in business and office occupations programs. At the post-secondary level, 73% of the disadvantaged enrollments were in this occupational program. At the secondary level, 36% of the enrollments were in office and business programs.

P.L. 94-142 sets an important precedent for all special populations by requiring that full educational opportunity be provided. In essence, special needs learners must have equal access to *any* vocational education program provided by local education agencies. Major efforts are needed to overcome the traditional occupational stereotypes associated with certain handicapping conditions. Parents and special needs students must be provided with comprehensive, but nondirective career guidance services that will aid them in making meaningful educational and employment choices.

### Cooperative Work Experience Programs

Co-op programs that permit students to be employed for part of the school day have been a popular programming arrangement for providing special needs students with occupational skills. Forty-seven percent (47%) of the 62 disadvantaged high school projects studied by Olympus had a work education component. Almost half of the students were enrolled in work experience programs. However, at the post-secondary level only 4% of the programs provided work education opportunities for the disadvantaged. In the national study of handicapped programs, 20% of the projects were identified as primarily work experience programs. That is, a majority of the students worked on part-time jobs. However, in an additional 30% of the programs, some handicapped students were referred to a work experience class. In both of the Olympus studies, major concerns regarding the quality of the work experience program were cited. Specific concerns were related to the lack of written training plans and the marginal relationship of the on-the-job experience to the in-school vocational education program.

The Iowa study indicated that more than 56% of the special needs students being served in vocational classes had available to them a special education work study program, as well as other work experience programs.

### Identification and Assessment

To systematically and effectively serve special students, procedures for identification and assessment of learning problems are essential. The studies identified several problems related to identification and assessment of special needs students.

The Olympus handicapped study found that students were evaluated and classified by special education personnel long before they were referred to the vocational program. Very rarely were assessments (e.g., occupational interest or aptitude) done by vocational educators once students were referred. Labeling was found to be a concern among the educators interviewed and a resultant trend toward the classification of students as "special needs" students was noted. Similar problems existed in the Olympus study of the disadvantaged programs. There was a lack of criteria for identifying disadvantaged students and a corresponding lack of adequate assessment procedures for determining the conditions which cause school failure.

In the Iowa study, the 1,265 vocational education teachers responding noted a major need for assessment and diagnosis skills. Teacher inservice activities involving "diagnosis of individual student needs" was clearly marked as the highest inservice training priority.

The Minnesota study noted several global special needs assessment problems from the secondary data that were examined. First, definitions and indicators are more specific and consistent across levels of government and agencies for handicapped than for disadvantaged persons. Considerable variation in expertise, information, and technology is needed to identify disadvantaged and handicapped students. Special needs students can be identified in terms of causal and effect (functional) characteristics. Knowledge of functional characteristics seems of most concern to vocational education.

It appears that strategies for identification and assessment of special needs students continue to be a mystery for vocational educators. The need to understand the functional educational needs of special students prior to instructional planning is widely recognized. To ensure appropriate vocational instruction, much more must be known about the special student by the vocational educator than is presently known.

### Interagency Coordination

Historically, a number of federal and state agencies have provided services to individuals with special employment or educational problems. With the involvement of several agencies and professionals in serving a common individual or group of special needs individuals, a potential for duplication as well as gaps in service delivery exists. This problem of coordination has plagued special needs vocational education on oı within school level, as between the school and community-based agencies.

The Olympus disadvantaged study recommended that local vocational administrators should be required to coordinate their programs with other agencies (school and nonschool) which provide services to the target population. This study found little evidence of interagency or comprehensive planning for handicapped students in vocational education at the local or state level.

In times of public fiscal restraint it becomes imperative that programs and services for special groups be efficient and cost-effective. Coordination between and among vocational, regular and special educators, CETA personnel, and vocational rehabilitation is essential for the functions of referral, assessment instruction, support services, evaluation, placement, and funding.

### Staff Attitudes

The involvement of special needs individuals in vocational programs is a new experience for most vocational education teachers. The extent to which teachers are supportive or nonsupportive of district efforts to serve these students is critical to overall program success.

The Iowa study of vocational education teachers revealed that approximately one-third of the teachers were not supportive of the concept of integrating or mainstreaming special needs students. Approximately 37% said that every effort should be made to integrate special students, while 24 indicated that they did not hold any strong feelings in either direction. The Olympus handicapped and disadvantaged studies did not examine staff attitudes directly, but noted that one of the most frequently mentioned constraints limiting the expansion of vocational programs for the handicapped was the reluctance of regular class teachers to accept the special needs students.

It would appear that continuing efforts are needed, through inservice programs, to assist in developing positive teacher attitudes toward serving the special needs student in regular vocational classes.

### Preservice and Inservice Training

These studies clearly substantiate the numerous recommendations offered in the literature regarding the major and continuing need for the training efforts. The Olympus disadvantaged study recommends that inservice training for all staff, delivered either by state personnel or by contract, must be provided. Teacher training institutions should be involved in inservice activities, as well as in efforts to make appropriate changes in the preservice curricula for preparing vocational education teachers. The Olympus handicapped study emphasizes the need to provide vocational instructors with special education techniques to effect program expansion as well as to improve program quality.

The Iowa study examined the inservice and preservice training needs in greater depth and offered a series of key recommendations. The need of "awareness level" inservice activities was stressed for *all* personnel involved in vocational education at the local, community college, university, and state levels. In addition, "how-to-do-it" inservice experiences were identified as needed for identification and assessment of special needs students, developing individualized instruction, monitoring and evaluating student progress, and conducting follow-ups. The use of several diverse inservice approaches, including local team involvement and observation of innovative programs, was recommended.

### State Education Agency Management

Since the mid-1960's, state departments of education have undertaken increasingly complex roles and responsibilities relative to administration of the federal programs of vocational education and special education. In various states, different arrangements have been developed for funding, administration, evaluation, monitoring, technical assistance and other state-level functions. The Olympus studies and the Minnesota study examined several key variables relative to SEA management.

The following are some observations and recommendations from the Olympus studies which appear to be points of agreement concerning state administration:

- Clear and articulate policy issuances regarding comprehensive vocational education for special needs populations were lacking.
- Planning is short-term in nature and usually directed at justifying certain projects.

- The majority of the states spend their vocational education set-aside funds for the handicapped and disadvantaged on a project basis. Local districts and post-secondary institutions develop and submit funding proposals for programs that they wish to operate to serve special needs youth. Block grants to local education agencies was the second most frequent method of funding used by the states.
- Planning, monitoring, and evaluation of projects and programs was handled on an informal basis. The number of special needs state staff assigned to these activities was frequently limited, thus severely limiting comprehensive, in-depth planning and monitoring.
- State education agencies responsible for vocational education appear to need assistance in interagency coordination, improvement of management information systems, and interactions with state advisory councils and panels.

## SPECIAL NEEDS RESEARCH PRIORITIES FOR THE 1980's

This review has presented and analyzed four major studies focused on vocational education for special needs populations. These studies, as well as others, suggest a large array of continuing issues and problems requiring research. It is interesting to note that serving special needs students is a continuing priority in federal agencies such as the Bureau of Occupational and Adult Education (BOAE) and the Bureau of Education for the Handicapped (BEH). The most recent listing of proposed BOAE research priorities in the *Federal Register* (June 13, 1974) lists serving special needs students, basic skills, and vocational equity as among the eight national priorities — all of which have direct implications for improving vocational education's capacity to serve special groups. The Bureau of Education for the Handicapped has considered vocational/career education as a priority in their teacher training and field-initiated research programs since 1974. Numerous other federal agencies, such as the U.S. Department of Labor, the Office of Career Education, and the National Institute of Education, have provided leadership for research on the career development and employment of special populations. Without question, one can review the research priorities of these agencies for the past seven to ten years and find some level of funding commitment.

### Research Priority Conferences

Conferences and conventions typically provide opportunities for exchange and dissemination of research. In recent years, however, several conferences have been held to review and identify specific research priorities in this field.

In January 1975 the Bureau of Education for the Handicapped sponsored a conference at Princeton University entitled "Career Education for the Handicapped" to identify top-level research priorities (Doty, 1979). The participants focused on seven major areas of concern: attitudes, critical incidents in employment, communication and professional interaction, mobility, demonstration and dissemination, decision-making, and employability. In follow-up to the Princeton Conference, a second BEH-sponsored conference was held at the

University of Kentucky in 1976 (Appell, 1976). Among the topics identified as needing future research were:

1. A definition of career education which incorporates those components necessary for successful working and community living.
2. How and when the assessment of career potentials of handicapped students could be conducted.
3. The development of the career education process for various handicapping conditions.
4. Development, dissemination, and utilization of career education project efforts.

In October, 1979 a group of 23 individuals representing the Big Ten Universities met at the University of Illinois to discuss research related to the career development of special populations. The two-day meeting focused predominantly on basic research needs. Among the major research problem areas identified were:

1. Assessment of the impact of preservice and inservice teacher education efforts.
2. Assessment of the longitudinal effects of vocational programs on special needs students and related populations.
3. Validation of teaching methodologies.
4. Evaluation of learner assessment practices.
5. Development of functional diagnostic procedures to identify unique learning needs of special populations.
6. Assessment of the effects of interdisciplinary and interagency strategies.
7. Adaptation or adoption of research paradigms from other disciplines.
8. Validation of attributes of successful teachers and employers working with special needs populations.

### Some Critical Research Needs

The four studies presented in the review, as well as insights provided by the review of literature, suggest that there are at least four major studies that should be initiated.

1. There exists a major need to assess the efficacy of vocational education programming and services for the handicapped and disadvantaged. The most recent comprehensive national assessment studies were conducted by the Olympus Research Corporation in 1974 and 1976 prior to the 1976 Amendments. Major re-directions have been initiated by P.L. 94-142, Section 504, of the Rehabilitation Amendments of 1974, Youth Employment and Demonstration Projects Act (YEDPA), and P.L. 94-482. Little is known on a national level about the nature of the occupational program enrollments, types of students served, program completers and leavers, administrative and management systems, recruitment and intake procedures, staffing, interagency efforts, funding patterns, employer satisfaction, and alternative programming models. A national assessment study, or series of studies, of this nature should examine programming for the handicapped, disadvantaged, native Americans, and limited English speaking on both a state and local level.
2. The 1976 Amendments permit states to use Subpart III-Program

Improvement and Support Services funds on national priority programs. Many states appear to be using this option to fund teacher training and curriculum development projects related to special needs populations. Sharing and dissemination of these project efforts across states could be significantly enhanced if a project was conducted to identify, describe, catalog, and disseminate the funded program improvement activities dealing with special needs populations. Such a project would also identify the extent to which the various program improvement and support service functions (research, curriculum development, guidance, personnel development, innovative and exemplary, and sex bias) are focused on special needs populations.

3. Local program evaluation practices are strongly emphasized in the 1976 Amendments (Section 104-401). Specifically, states are required to examine the "results of additional services that are provided under the Act to the following special populations: women, members of minority groups, handicapped persons, disadvantaged persons, and persons of limited English speaking ability." A national study which examines the states' efforts to date in this area would help to determine: (1) types of evaluation strategies being used, (2) level of support services being provided, (3) problem areas in serving special population, and (4) recommended improvements in federal legislation and regulations.

4. There has been a continuing debate in the field regarding a specific target population approach (e.g., handicapped) versus a "special needs" approach to serving those identified in the national priority programs section of the 1976 Amendments. The basic question focuses on the extent which programming models, instructional and counseling strategies, and support services are similar or different. A study which examines the potential commonality of these strategies could greatly increase the efficiency of teachers and administrators in dealing with all special needs populations.

## A Research and Program Improvement Paradigm

The development of paradigms that outline the critical dimensions of a particular field is another approach for examining research priorities. With rapidly emerging mandates to serve various special groups and an expanding body of knowledge, it is imperative that research efforts be comprehensively planned and coordinated. The paradigm presented in Figure 1 presents a model for contrasting research and program improvement activities across the major delivery system components involved in serving the vocational education needs of special populations. Within each cell the reader could identify existing research projects related to serving special needs learners. The matrix can also be used to identify needed program activities. In those cells where project activities cannot be identified, perhaps exploratory needs assessment studies are warranted. Other cells may show several existing projects.

The comprehensiveness or coordination of program improvement activities can be illustrated via the paradigm also. For example, it is possible to examine the need for and elements of effective interagency cooperation at the local, state, and federal education agency levels.

Continuity of program improvement activities is also an emerging

## FIGURE 1
## A Research and Program Improvement Paradigm for Vocational Education and Special Populations

| **Delivery System Component and Functions** | **Program Improvement Activities** | | | | | |
|---|---|---|---|---|---|---|
| | Needs Assessment/ Problem Identification | Program or Curriculum Development | Demonstration/ Experimental Programs | Dissemination and Utilization | Inservice/ Preservice Training | Evaluation |
| Local education agencies (secondary and post-secondary)<br>● Recruitment and intake<br>● Identification processes<br>● Learner needs assessment<br>● Support services<br>● Individualized programming<br>● Inservice/staff development<br>● Coordination of community resources<br>● Learner progress assessment<br>● Cooperative work experience<br>● Other processes | | | | | | |
| Special vocational school programs (for severely handicapped/disadvantaged populations)<br>● Severely handicapped programs<br>● Corrections programs<br>● Job Corps<br>● State schools for the blind/deaf<br>● Other programs/schools | | | | | | |
| State education agencies<br>● Funds distribution<br>● State planning<br>● Policy development<br>● Evaluation<br>● Interagency cooperation<br>● Monitoring<br>● Program improvement and support services<br>● Technical assistance<br>● Other functions | | | | | | |
| Federal education agencies<br>● Policy formulation and dissemination<br>● Technical assistance to states<br>● Monitoring and evaluation<br>● Program improvement activities of national significance<br>● Inter- and intra-agency policy development | | | | | | |
| Teacher education institutions<br>● Preservice training<br>● Inservice training<br>● Graduate education<br>● Research<br>● Service<br>● Other functions | | | | | | |

national concern (Cheney-Stern & Evans, 1978). Once critical research and development needs are identified, continuous efforts must be made to develop appropriate programs or curricula, test and validate, disseminate, and evaluate the research products. To achieve their maximal impact, major research needs or problems need to be translated into materials, resources, knowledge, or products that practitioners can use to improve vocational opportunities for special needs youth and adults.

To address systematically research and program improvement needs, the profession needs to examine the process comprehensively. As the columns in the paradigm suggest, program improvement involves a sequential process: (1) a determination of needs, (2) curriculum and/or program development, (3) validation of curriculum and program models via demonstration programs, (4) dissemination and utilization activities, (5) installation in preservice and inservice personnel training programs, and (6) evaluation of the program improvement activities for a selected research priority, as well as for the total program improvement process.

States and local school districts should annually review their programmatic and research needs in providing vocational education to special populations. As the Iowa and Minnesota studies revealed, there are a number of needs that can be revealed on a state-wide basis. Further, the Iowa study generated needs assessment data from vocational teachers that local administrators would find useful in planning additional support services, initiating new programs, or planning staff inservice sessions.

Once the major needs relative to programming for special needs populations are known, efforts can be undertaken to develop innovative programs, new curricula, new instructional materials, etc. With major efforts being initiated toward mainstreaming, several inservice-staff development programs have been developed to assist vocational educators to deal with special needs students. Development of curriculum resource materials focusing on teaching basic skills (e.g., vocational reading and vocational math) to special needs students has also been initiated.

The third phase of the program improvement process should involve testing, validation and appropriate revision of the program or curriculum model. This can be achieved in a variety of ways, but it is usually done in the form of a demonstration program. As noted in the review, numerous curriculum materials and instructional packages for special needs students in vocational classes have been developed. Most of these have focused on individualizing vocational instruction for handicapped and disadvantaged students (Hull, 1977). Several national and state agencies (most notably the Bureau of Education for the Handicapped) have prepared descriptions of exemplary programs. It appears, however, that few instructional or curriculum packages or exemplary programs have been tested or validated (with appropriate data collection) to describe their long range outcomes. Part of this lack of data is attributable to the recent development of the field. Training and resource materials to assist vocational special needs professionals in designing and testing demonstration programs and materials is critically needed.

Following the testing and validation phase, a comprehensive planning for dissemination of the model, concept, material, etc. should occur. Many research and development products (e.g., instructional material bibliographies, teacher guides, state planning guidelines, etc.) do not achieve their maximum impact because of fragmented or incomplete dissemination. A comprehensive dissemination plan should include strategies for dissemination via: (1) national information and dissemination systems (e.g., ERIC, The National Center for Research in Vocational Education), (2) state, national, and local conferences, (3) articles in journals and newsletters, and (4) other project-related activities (e.g., specially-designed workshops). During the design and development phase of the project, serious consideration must be given to the user audiences and their organizations in which they work. During the testing phase various techniques for obtaining administrative support, financial support, and adoption of the concept should be examined.

Research and development projects focused on improving vocational education for special needs populations have been short-sighted in their dissemination and utilization plans. That is, the dissemination efforts are focused on a primary group such as vocational education teachers or special education teachers. Dissemination workshops and other activities should stress the cooperative involvement of vocational educators with the specialists involved in serving the special needs student at all levels. Parents, counselors, administrators, advisory committee and school board members should play active roles in the dissemination and adoption of new strategies for serving special students.

To ensure the full adoption of knowledge and products developed via research and development projects, efforts to train and re-train personnel are needed. The Iowa study and national Olympus studies pointed out the major and continuing need to prepare vocational teachers and administrators to deal with special needs students. Certainly, this need has been created more in response to the legislative mandates for mainstreaming, than for the need to adopt new research products. However, one can also observe that this need has generated a number of comprehensive research and program improvement activities focusing on personnel development (e.g., research on needed teacher competencies (Albright, Fabac and Evans, 1978), development of inservice and preservice programs (Meers, 1977; Hartley, 1977) ).

Within the paradigm the inservice/preservice training phase is directly related to utilization. In most instances, if research products are to be effectively utilized, training must be provided to the personnel responsible for their implementation in the classroom or other appropriate settings. As projects are developed and products tested, extensive consideration should be given to addressing: (1) What competencies will be needed by teachers or others to implement the research product(s)?, (2) How can the research be built into university teacher training programs?, and (3) How can the vocational or special education teacher be prepared to use these new materials? Obviously, this requires that university and college personnel who are involved in teacher training be involved in at least the dissemination aspect of research and development projects.

Increased involvement of teacher educators in research and program improvement activities should facilitate the use of research products in undergraduate and graduate courses

Evaluation is the final program improvement activity in the cycle. Once the research and development product(s) has been disseminated and some degree of utilization has occurred, there must be a continuing commitment to assess the impact of the product(s). Section 104.704 of the federal rules and regulations for the Vocational Education Amendments of 1976 requires that state-funded research projects demonstrate "as reasonable probability that degree of the contract will result in improved teaching techniques or curriculum materials that will be used in a substantial number of classrooms or other learning situations within five years after termination date of the contract." This, and other mandates for educational accountability, place a greater emphasis on evaluation of program improvement and research activities. Follow-up studies of research efforts will help to insure their continued use. Appropriate improvements can be made in research products if organized efforts are made to monitor and evaluate their use over at least a five-year period.

Program evaluation activities, in themselves, can be viewed as program improvement activities. State boards of vocational education also have a mandate to evaluate, at least once every five years, the vocational education programs receiving federal, state, and local vocational education funding. A part of the evaluation involves assessing the impact of support services provided to special populations. Similar local evaluations are required of special education and CETA programs under federal legislation. The results of such evaluations can be extremely helpful in identifying research and program improvement needs within the local district. Policies and systematic efforts are needed to insure that these results are used at the local and state levels to determine research needs, teacher training needs, and curriculum and/or program development needs.

## SYNTHESIS REFERENCES

Appell, M. J. *Career education for the handicapped: Some issues and researchable items.* Document prepared for a conference on Career Education for the Handicapped, Bureau of Education for the Handicapped, University of Kentucky, July 13-15, 1976.

Albright, L., Fabac, J. and Evans, R. E. *A system for identification, assessment, and evaluation of special needs learners in vocational education.* Urbana: Bureau of Educational Research, University of Illinois, 1978.

Cheney-Stern, M. and Evans, R. N. Effects of continuity on the impact of vocational education research. Unpublished paper. Department of Vocational and Technical Education, University of Illinois at Urbana-Champaign, December, 1978.

Doty, C. R. Priorities for research for career education for the handicapped. *Journal of Industrial Teacher Education*, 1979, *16* (4), 46-55.

Greenwood, C. S. and Morley, R. E. Iowa vocational education/special needs assessment project. Des Moines: Iowa State Department of Public Instruction, 1978.

Hartley, N. Pre-service programs for preparing special needs personnel. *Journal of Industrial Teacher Education*, 1977, *14* (2), 36-40.

Hull, M. E. Vocational education for the handicapped: A review. Information Series 119. Columbus: Center for Vocational Education, The Ohio State University, 1977.

Meers, G. D. Inservice programs for preparing special needs personnel. *Journal of Industrial Teacher Education*, 1977, *14* (4), 41-45.

Olympus Research Corporation. An assessment of vocational education programs for the handicapped under Part B of the 1968 Amendments to the Vocational Education Act. Salt Lake City, Utah: author, 1974.

Olympus Research Corporation. An assessment of vocational education programs for the disadvantaged under Part A and Section 102 (b) of the 1968 Amendments to the Vocational Education Act. Salt Lake City, Utah: author, 1976.

Schneck, G. R., Lerwick, L., and Copa, G. H. Assessment of the prevalence and service need requirements of handicapped and disadvantaged students in vocational-technical education programs in Minnesota. Minneapolis: Minnesota Research and Development Center for Vocational Education, University of Minnesota, 1978.

# SECTION FOUR

## Research Grounds of Career Development Theory, 1975 —

---

RICHARD W. FELLER and DAVID V. TIEDEMAN
Northern Illinois University

# Research Review

## THEORY CONSTRUCTION AND THE DEEP STRUCTURE OF THEORY IN CAREER DEVELOPMENT

The structure of these *Annual Reviews of Research in Vocational Education (ARRIVE)* offers much to readers interested in the structure of scientific revolutions (Kuhn, 1970) as we presume you to be.

Research has both substantive and procedural dimensions. The coeditors have elected to construct this review so that it illuminates research in career development during the past five years in both these dimensions. Of the two, the hardest to illuminate is the substantive dimension. Research ordinarily bears some, but not a great deal of, relationship to the deep structure of theories. But the goal of science is to perfect the deep structure of generalizations bearing upon one or another phenomenon observable in the natural order of things, events, and the actions of persons in events.

Since we seek further perfection of the theory of career development in this review, we must depart from the assigned structure for all reviews in *ARRIVE* in two ways. The first such departure is to sketch at the outset the deep structure of theory in career development which has evolved in the past 30 years, the period since the last revolution in the theory shook up the basic paradigm upon which the deep theory in career development currently rests. The second departure from the assigned structure appears in the concluding synthesis section, in which we attempt two rather than one syntheses. The first synthesis we provide is that of the literature summarized in the next section and of the lighthouse studies included in the third section. This synthesis is made in terms of the present deep structure of career development theory. A second synthesis offered in the concluding subsection arises from: 1) differentiation of decision from choice as a foundational paradigm for theory in career development, and 2) reintegration of work on decision making development which Tiedeman and his colleagues have published over the last 15 of 30 years. Our intention is to change the basis for theory in career development from investigation grounded in occupational choice to investigation grounded in personal comprehension of career as a construction perfected throughout life. For our purpose, and for the purpose of providing context for the summarization of research in career development of the last five years, we next construct an overview of the present deep structure of career development theory.

A deep structure of theory in the career development of males has formed throughout the past 30 years. The process of occupational choice in childhood, adolescence and young adulthood, formulated by Ginzberg, Ginsburg, Axelrad, and Herma (1951), was first placed into a more extensive structure by Super (1957), who made the self concept the locus of the occupational choice process and specified a very broad developmental framework within which self concept and occupational choice interact. Roe (1956) and Holland (1959) contributed needs satisfaction classifications of occupations which have a common two-dimensional base and associated circular assumptions about the relationship of personal needs and occupational choices, although their occupational classifications are not identical. In addition, Roe strove to anticipate later occupational choice from the home climates in which persons are raised while Holland worked assiduously on the work climates in which persons choose to operate in order to increase the relationship between people's inventoried preferences prior to employment and the kinds of occupations they later pursue.

Both Crites (1969) and Osipow (1973) subsequently drew this seminal work together. Crites' monumental treatise on vocational psychology organizes the essential research literature up to about the turn of the present decade. As a result of its emphasis upon research, Crites has to divide the study of vocational psychology essentially into studies of vocational choice and studies of vocational adjustment. The work he reports on vocational and occupational choice gives some attention to studies of choice-related vocational maturity and development. His section on vocational adjustment attends to the plethora of studies dealing with vocational adjustment, motivation, success, and satisfaction, essentially independent concepts with which the field has been plagued because such studies are not generally organized into any kind of personal developmental context. Whether career development develops or not remains a moot point for many investigators, but the field of career education blithely proceeds on the assumption that career can develop, at least if helped to do so.

In his 1968 book (revised in 1973), Osipow attends to the *theories* of career development, rather than the *theory*. Together, the Crites and Osipow books provide a firm foundation for current beliefs in career psychology. Osipow summarizes the theory and research bearing on seven different conceptions which are currently used in construing various aspects of vocational behavior. Crites attempts the more ambitious, and therefore more ambiguous, task of inducing a theory of career development from its research. Actually, the generalizations about career development which we can derive and observe without exception require both keen attention to what we seek to know and keen thought about the way in which those effects appear in the natural realm. This is why we organize this review as we do.

In the next section, research in career development which has been published since about 1975 is used to infer what seems to be going on in research toward advancing current understandings of career development. We have selected four studies which have been thrown by their authors into the pond of current belief about career development theory and advance several observations on the ripples they seem to create in that pond. Finally, we attempt synthesis of both the recent research and the recent challenges of career development theory. Our theme will be that of decision making development as it manifests in the career. Contrary to popular belief, choice and decision are not alike. Choices are preferences either for individually derived options or for options offered by others. Decisions, on the other hand, are action sets which are grounded in individually evolved choices. The co-editors believe that individuals can come to comprehend both their decisional processes and the developments of their decisions. We use that theme as a synthesizing element of the work on career development research we review. By doing so, we hope to create a few ripples of our own in the pond of current belief about career development theory. These ripples, in their integration around decision making development in career rather than around choice development, as at present, can have the affect of causing our present career development theory pond to overflow and re-establish its basic deep structure, thereby having effected a scientific revolution in the basic paradigm in which we construct theory in career development.

## RESEARCH: 1975-1979

The October issue of the *Journal of Vocational Behavior* has contained a review of career development research for each of the past several years. These reviews, and the review of journals and educational documents which the authors undertook to augment them and bring them up-to-date, indicate expanding attention on consistent topical threads for the period 1975-1979 and are used to organize this section.

Without question, professional journals continue to be frequented with further elaborations and examinations of career development theory in the continuing search for a comprehensive and more general model. However, that emphasis is complemented by the increasing attention which is being given to the development and assessment of delivery systems to foster the development of career. The research literature also contains a constant stream of evaluations and explorations of assessment instruments which measure interest, occupational choice, career maturity, career skills, and self-estimates. Apart from these traditional areas of career development research, the 1975-1979 period of investigation marks noticeable gains in the study of sex roles, and the impact of sex-stereotyping on career development. Career development for females is gaining attention equal to that traditionally given to the career development of males. In addition, the noticeable effort given to the collection of data about the process of career development for women, minorities, and adults, as well as the study of career indecision and mid-career change, leads one to conclude that the period from 1975 to the present bears considerable fruit.

### Elaborations and Examinations of Career Development Theory

During the past five years, several investigators have proposed new theories of the deep structure of career development. Crites (1976) continued effort begun in his 1969 book on vocational psychology to formulate a general model of career development within which it might prove possible to organize the variety of research now being undertaken on the subject. His 1976 theory elaborates upon that model and takes advantage of the considerable work on vocational maturity which he completed in the interim.

Krumboltz, Mitchell, and Jones (1976) propose that career decision making be understood within a social learning framework. Their paper on this subject is offered in the next section as one of the stones we throw into the pond of current belief in career development which is likely to cause more than a few ripples.

Peatling and Tiedeman (1977) go beyond Krumboltz, Mitchell, and Jones by proposing a self constructionist group model of personality reconstructionism within which they believe that the self develops in the social context outlined by Krumboltz, Mitchell, and Jones. This theory specifies the identity element and the four generating elements which lead to mature operation of personal involvement in the development of career, not just personal presence in the development of career. Tiedeman and Miller-Tiedeman (1977) and Miller-Tiedeman and Niemi (1977) deal further with this concept of personal empowerment in career in a two-phase primer on theory and practice. The Peatling and Tiedeman book builds upon another by Dudley and Tiedeman (1977) in which those authors thoroughly discuss the process of exploration and commitment in career development. Dudley and Tiedeman's major interest is in the relationship of structure and function as it operates in creativity. They particularly examine those cognitive processes which we experience in the hierarchical restructuring of our thought and of actions based in thought.

Examination of the Krumboltz, Mitchell, and Jones model in the following section will reveal its consistency with behaviorism. Crites, Holland, Krumboltz, Mitchell, and Jones are all investigators trying to infuse that element into a theory of career development seemingly rife with non-investigable, self conceptions. Thoreson and Evart (1976) joined these investigators in that purpose during the review's period by stressing the application of behavioral self-control in career counseling.

General theories on the career stages which women experience also started to appear in the period under review. Brooks (1976) constructed a system of transition for the mature woman re-entering the career world. Based on effective decision making, she indicates that women, in contrast to men, experience seven stages during which they must overcome low self-confidence, time management problems, role conflicts and guilt.

On a less broad conceptual level, Knefelkamp and colleagues advanced models by which one can work with the cognitive complexity of an individual's career conceptions in programs designed to advance career maturation (Knefelkamp & Slepitza, 1976; Knefelkamp, Widick & Stroad, 1976). Baumgardner (1976) focused attention on thinking orientation. Schoon (1976) emphasized affect in the study of career choice, and Dawis and Lofquist (1976) further elaborated their theory of work adjustment.

The essential question in a theory of career development is whether the career develops or not. During this period, Hershenson and Lavery (1978) gathered further support for their proposed sequencing of developmental stages in career. Hall and Mansfield (1975) did much the same as security needs increased while self-actualization needs dissipated among workers undergoing work function adjustments. Kapes and Strickler (1975) in comparing the longitudinal development of occupational values found increasing strength in the work values of grade nine to twelve students. Wijting, Arnold, and Conrad (1977) generally found work values to change in both degree and nature as predicted in students advancing through the educational system. Dietrich (1977) found similar results among nursing students as their work values shifted from an extrinsic to an intrinsic nature during their transition from freshman to senior year.

Munley (1975), studying the psycho-social development of careers found vocational development following the context and developmental theory of Erikson. In a re-examination of Ginzberg's work, Howell, Frese, and Sollie (1977) found movement from fantasy choice to realistic anticipation occurred as a result of perceived reality factors which inhibited the maintenance of aspirations. It appears that much of the current effort to establish a comprehensive model of career development theory begins with adding water to old soil rather than with equal efforts to add new strains of fertilizer as well. The latter notion is argued throughout this paper as the authors work to turn research on career development toward new directions in the quest for a comprehensive model grounded in a decision paradigm rather than in a paradigm of choice, as the current deep structure of career development theory is.

Research on occupational choice in career development continued to offer generalized support for Holland's assumptions about the six areas of human needs which work environments satisfy (Andrews, 1975; Holland, Gottfredson & Nafziger, 1975; Walsh & Hanle, 1975; Westbrook, 1975; Yonge & Regan, 1975; Holland & Gottfredson, 1976; Mount & Muchinsky, 1978).

In addition, Turner and Horn (1975), Yom, Doughtie, Wei, Alston and Wakefield (1975) and Wakefield, Yom, Doughtie, Chang and Alston (1975), concluded that Holland's theory operates in black college students and in Mexican Americans as well as it does in white males generally. The general robustness of Holland's theory was additonally sustained among employed non-college degreed women (Matthews & Walsh, 1978) and non-professional workers (Salomone & Slaney, 1978).

Although investigated much less frequently, Roe's occupational classification theory was upheld in an investigation reported by Medvene and Shueman (1978).

### Interventions Promoting Career Development

Since 1975, maturing interests in career education have produced numerous investigations evaluating interventions in personal career development. As the United States Office of Education continued to produce its *Monographs in Career Education* to serve as a forum for debate among those tending to the implementation of career education, Peters and Hansen (1977) offered their third anthology which provided access to articles providing encouragement for career education and guidance efforts.

Holcomb and Anderson (1977), however, concluded an analysis of vocational guidance from 1971 to 1975 by finding an imbalance in research and interventions related to specific career development problems and populations. College students served as the principal persons studied at the expense of the aged and unemployed. Results suggest that more research should examine (1) non-school populations, (2) career counseling processes, methods, and outcomes, (3) vocational information, and (4) attitudes and processes necessary to make a vocational decision.

As a result of varied career education interventions with students in general, Omvig, Tullock, and Thomas (1975) found significant growth in career maturity on the Career Maturity Index (CMI) that Bergland and Lundquist (1975) didn't find in minority students. Flake, Roach and Stennid (1975) increased self-appraisal and Egner and Jackson (1978) improved career maturity and decision making scores through counseling program interventions. Fisher, Reardon and Burck (1976) increased information-seeking behavior through videotape usage, and Mendonca and Siess (1976) successfully treated career related anxiety. Reports from Krivatsy and Magoon (1976) supported the use of the Self-Directed Search (SDS) to decrease career indecision while Zener and Schnuelle (1976) applauded both the Vocational Preference Inventory and the Self-Directed Search for affirming and expanding occupational choices. Additionally, Cooper (1976) found support for the Non-Sexist Vocational Card Sort as a device which expanded occupational options and career seeking behavior.

Malett, Spokane and Vance (1978) found that offering brief career information to male college freshmen increased congruence in measured interests of low congruent counselees but Remenyi and Fraser (1977) found that a similar program had a leveling effect on occupational status perceptions of university students. Oliver (1977) found individual test interpretation to be more satisfying than multiple and programmed modes. By employing a Personal Achievement Skills program with rehabilitation clients, Roessler, Cook and Li Lillard (1977) recorded an increase in attitudes related to gaining employment. Hollandsworth, Dressel and Stevens (1977), in studying job interview skills, indicated that behavioral training in increasing eye contact in discussion groups fostered the ability of job seekers to express attitudes and feelings in job interviews. As computers in guidance gained meritorious attention, Harris-Bowlsbey (1976, 1978) published several papers on her new DISCOVER System and Chapman (1977), and Risser and Tulley (1977) did the same with SIGI (System for Interactive Guidance and Instruction). Cochran, Hoffman, Strand and Warren (1977) found that computer guidance by means of SIGI had positive effects on college major selection but not on career choice.

The literature in career development was enriched by Campbell, Rodebaugh and Shaltry's (1978) handbook of programs, practices and models which succinctly reviews significant career guidance techniques and delivery systems in secondary schools. Also, Drier, Davis, Hartz, and Stein in The National Center for Research in Vocational Education (1977) provided an extensive system for creating rural school career guidance programs. Of equal significance, the 52 competency-based staff development modules developed at the American Institutes for Research (1976) filled a void in career development training for educators.

### Sex Roles, Stereotyping, and Bias

While researchers more openly recognize since 1975 that previous research in career development has been dominated by the study of males and their occupational choice and adjustment, the women's movement has generated considerable interest in how gender affects career development. Both forces contributed a wealth of research addressing the topic.

Tibbetts (1975) reported that children still rigidly hold sex-stereotyped attitudes about work roles and Shinar (1975) indicated that occupations are clearly sex stereotyped by both males and females. On a similar note, Peterson and Peterson (1975) indicated that child care is more the mother's than the father's responsibility. In addition, the notion that women exhibit a "fear of success" received new confirmation by Barnett's (1975) investigation which further implies that women learn to avoid aspiration to high prestige occupations. McLure and Piel (1978) more specifically isolate the major reasons why women refrain from choosing careers in science and technology.

Crawford (1978) found a connection between feminine role perception and vocational choice in females as Ridgeway (1978) provided continuing support that the career orientation among mother-identified women was associated with more extensive maternal employment, less conventional sex role ideology in both parents, and greater dissimilarity between perception of self and father.

Oliver (1975) and Sorensen and Winters (1975) found fathers played a more impactful role on the level of career commitment of women. Sedney and Turner (1975) proposed that a woman's high achievement need may lead to career orientation and decreased heterosexual orientation rather than a failure to develop heterosexual associations leading to high need achievement. In studying female college students, Hall (1975) concluded that life stage is more important in determining role processes than chronological age while Richardson (1975) found that women who see themselves as homemakers are not career oriented.

Additionally, Stake (1979) suggested the detrimental effects of low levels of confidence in women's ability to resolve the home-career conflict and Terborg (1977) assessed women's self-perception to be a restrictive force in management positions. Goldman and Hewitt (1976) found women's career opportunities restricted by a weakness in mathematics-related abilities.

Arvey and Gross (1977) and Gross and Arvey (1977) found homemakers' level of satisfaction with their work role correlated with the autonomous aspects of the job, the degree to which husbands assumed responsibility for homemaker tasks, and husbands' attitudes toward women in general. While the number of children did not have impact on satisfaction, the lack of recognition and supervisory opportunities proved least satisfying. Data from a national opinion survey found women's job satisfaction related to life satisfaction, age, and importance of job income but did not relate to race, educational level, occupational prestige, income level, and attitude toward women working (Sell, Brief & Aldag, 1979). Peterson and Peterson (1975) reported that the notion that women might earn more money than their husbands in their work gained greater acceptance than heretofore.

Lunneborg (1978) cited three studies where no sex differences were found in career decision-making styles. However, Gackenback (1978) found that both black and white women are more liberal in their sex role attitudes in the home and work environment than black and white men, yet black women are more traditional than white women in sex role attitudes in the home.

Restriction in career alternatives results from sex role stereotyping, according to the findings of Burlin (1976), Greenhaus and Simon (1976), Lunneborg (1976), and Osipow (1976). Investigating the extent to which counselors' attitudes reflected stereotypes, Ahrons (1976) and Medvene and Collins (1976) found that public school counselors, psychotherapists and advanced graduate students all had restrictive attitudes. Donahue and Costar (1977) found bias toward girls most pronounced in older female school counselors and least restrictive among counselors working in cities of less than 25,000 population. Englehard, Jones, and Stiggins (1976), however, produced evidence indicating that sex role stereotyping by counselors was declining and Dipboye and Wiley (1977) found that recruiters rated identical resumes higher for females than for males.

Sex bias in interest measurement was of major concern to Peoples (1975) and was significantly monitored by the AMEG Commission on Sex Bias in Measurement (1977) which reviewed changes within 11 popular interest inventories. The Strong-Campbell Interest Inventory (SCII), the Strong Vocational Interest Blank (SVIB) and the SDS attracted most of the research attention. Within the SCII, Creaser and Carsello (1976) and Johnson (1977) concluded that only same sex scores should be interpreted. Further study by Campbell (1976) and Hansen (1976) indicated a need for additional scaling approaches to resolve the problem of sex differences in the SCII. Holland (1976) argued against the sex bias which Prediger and Hanson (1976a, 1976b) claimed existed within the SDS. During this time Rayman (1976) and Hanson and Rayman (1976) demonstrated through the Unisex Interest Inventory (UNI-II) and the American College Testing Interest Inventory (ACT II) that interest measurement could be based on sex-balanced items.

Project Born Free was developed by Hansen and Krierleber (1978) as a staff-development system addressing sex role stereotyping in career development. And while Yanico (1978) found empirical evidence of language's effect on sex bias, Knell and Winer (1979) garnered little support that well-established stereotypes could be counteracted by reading materials. Additionally, O'Bryant and Corder-Bolz (1978) indicated that television teaches children about jobs and work and what sex workers should be.

One of the advantages of personal interactions with a computer system on issues of career development is that the inquirers leave traces of their travels in the system as they proceed. SIGI (System for Interactive Guidance and Instruction) is programmed so that inquirers go through a sequence of specifying and clarifying their values, the selection of occupations and the assessment of the correspondence of each with their clarified values and career planning. Norris, Katz and Chapman (1978) report a carefully worked out study of the valuing processes exhibited by young adult males and females in their interactions with that system. The results indicate that sex differences still exist in the values and processes which males and females use in the system. In an interesting breakdown of these results, the section coeditors also found that both males and females who are less traditional in their value choices are less heterogeneous in their occupational choices than are those who hold more traditional value patterns.

## Reading the Adult Years and Special Populations into Career Development Theory

Research on career development has largely been concentrated in the childhood, adolescent and young adult periods over the past 30 years. Retirement emerged as an area of research concern in the mid 1950's and has continued to be of concern particularly as American citizens have proved able to retire earlier than heretofore. However, in recent years, growing attention has been given to the middle third of life. This interest is underscored by Sheehy's (1976) popular book *Passages*. That book draws heavily on the work of Gould (1978) and uses the work of Levinson (1978) as well. These latter two books represent thorough treatises on the developmental phenomena of the later life. They both have evidence indicating that development takes place and exists beyond college, the interval at which we traditionally have expected the personality to become set and subsequently to remain unmodified either personally or eventfully. *Passages* proves interesting but less helpful in potentially organizing the developmental phenomena of the adult years.

Since 1975, Crites (1976) supported developmental adult stages, Heath (1976) proposed further examination of personality dimensions in adults, and Murphy and Burck (1976) suggested the addition of a midlife career stage for men within Super's (1957) framework.

In studying adult workers, Fry (1976) found an increase in submissive attitudes towards authority in men moving from school to job. Kleinberg (1976) found high occupational stability within Roe's fields when comparing adolescents' characteristics and their work adjustments as adults. McLaughlin and Tiedeman (1974) found similar results as can be seen in their paper in the next section. Waterman and Waterman (1976), in a study of vocational identity, found small portions of men who could be classified as "identity achievers."

Interest in the career development of the mature adult expanded as Eden and Jacobson (1976) found resistance to retirement most prevalent among older executives who felt young, healthy, and effective on the job. Wexley, McLaughlin, and Sterns (1975) examined retirement at various points and found significant changes in psychological need levels.

A number of studies looked at career indecision. These resulted in the development of Osipow, Carney and Barak's (1976) Scale for Vocational Indecision. Hawkins, Bradley, and White (1977), McGowan (1977), Greenhaus and Simon (1977), and Barrett and Tinsley (1977a) all found variables related to indecision. Holland and Holland (1977) found evidence for classifying several subtypes of undecided individuals.

Attempts to research mid-career change and the role of leisure in career development have gained impetus since 1974. Wiener and Vaitenas (1977) identified traits less frequently characteristic of those who were classified as mid-career changers, and Fredrickson, Macy and Vickers (1978) reported results from 200 adults making career changes. The editor of the *Vocational Guidance Quarterly* acknowledged the growing interest in the middle third of life by dedicating the June 1977 volume to mid-life career change. The use of leisure to meet achievement needs was studied by Adams and Stone (1977) and London, Crandall, and Seals (1977) examined its effect on quality of life while Nuelinger's *The Psychology of Leisure* (1974), helped to broaden the researcher's notion of career.

Researchers seldom have addressed career development of special populations in theory or research. However, Picou and Campbell (1975) made significant gains in this area by compiling career findings related to special groups. Also, Atlas (1978) recently demonstrated the career planning needs of unemployed minority persons and Dixon-Altenor and Altenor (1977), and June and Pringle (1977) demonstrated the need for consideration of factors impacting on the development of blacks. Of particular note is the fact that the Native American Career Education Program (1977) includes career education units for native Americans.

### Measurement and Assessment

A good deal of the career development research published since 1975 is devoted to the assessment and measurement of career interests, abilities, occupational choice, career maturity, career decision making and self-estimates.

While Barrett and Tinsley (1977b) developed the Vocational Rating Scale which provides an assessment of awareness to specific vocational concepts, the more generally oriented Career Maturity Inventory (CMI) and the Career Development Inventory (CDI) continued as the popular research instruments of vocational development. Through the CMI, Omvig and Thomas (1977) concluded that a sex differential in career maturity should be expected between sixth and eighth grade students. Using the CMI and the CDI, Yen and Healy (1977) demonstrated that paid employment among junior college students increased career maturity while Katz, Norris and Pears (1977) developed an extensive career decision making exercise to directly measure competence in the process of career decision making. However, as Jepsen (1975) found support for certain measures of career maturity in high school students, Smith (1976) and Dillard (1976) suggested caution in using the CMI with lower class and/or minority persons, and LoCascio, Nesselroth and Thomas (1976) made similar comments about the CDI. Once again a positive correlation between career maturity and intelligence was confirmed by Lawrence and Brown's (1976) investigation.

In the recent past, investigations of interests continued to generate research possibilities. Grimm and Nachmias (1977) found that divergent thinkers held a wider range of interests than anxious subjects who were more affected by the prestige value of future occupations. Studies by Horton and Walsh (1976), Fishburne and Walsh (1976) and O'Brien and Walsh (1976) provided stringent tests of the validity of the Vocational Preference Inventory (VPI) and the SDS and added some support to Holland's (1959) hypothesis that people seek needs satisfying environments while Villwock, Schnitzen and Carbonari (1976) found modest support for the notion that stability of vocational choice can be predicted. Bobele, Alston, Wakefield, and Doughtie (1976) and Alston and Wakefield (1976) found modest support for Holland's (1959) hexagon model while Smart (1976) found contering evidence.

Miller-Tiedeman (1976) developed the Individual Career Exploration (ICE) which is modeled upon the SDS structure but uses the Roe (1956) occupational categories rather than the Holland (1959) categories on which the SDS is based. Miller-Tiedeman (1977) later provided a picture form of the ICE for use with persons of low English reading ability.

Support for the usefulness of personality scores as predictors of vocational persistence was sustained by Scott and Sedlacek (1975) and Holland and Nafziger (1975) reported positive correlations of the SDS with the Kuder Preference Record, the Bennett Mechanical Comprehension Test, the Minnesota Paper Form Board, and the Thurstone Temperament Schedule. Further research by Holland, Takai, Gottfredson, and Hanau (1978) concluded that the SDS achieved its effects because of the numerous options it offers.

The Strong-Campbell Interest Inventory (SCII) also attracted extensive study as Slaney (1978) found support for incorporating the Holland themes and the SCII basic interest categories into the Vocational Card Sort (VCS). Lunneborg (1977) concluded that the SCII had excellent construct validity while Fabry, Blake, and Seran (1977) demonstrated validity between the General Occupational Theme scales and the scales of the American College Testing Interest Inventory in high school students.

The Kuder Occupational Interest Survey was found by Zytowski (1976) to have greater significance for predicting college majors than occupations and tended to have greatest validity for persons who attend college, or enter high-level scientific or technical occupations. Tittle and Denker (1977) found that the Kuder Occupational Interest Survey (KOIS) provided good differentiation of interests for older women reentering the labor market while Zytowski and Laing (1978) concluded that rankings on other-gender scales provided reasonably accurate estimates of expected rankings on unavailable own-gender scales.

Once again, as in previous studies, expressed interests indicated greater predictive validity than inventoried interests according to Borgen and Seling (1978) and Fabry and Poggio (1977). Expressed vocational choices of high school students proved to be more predictive of future employment status than the VPI or the Kuder Preference Record according to Wiggins and Weslander (1977). Becker (1977) found students expressing the selection of a vocation and the intention of attending college to be more characteristic of students whose expressed and inventoried interests were congruent. However, Hodgson and Cramer (1977) found self-estimates of ability required by the SDS potentially lead to unrealistic decisions.

In comparing Holland's (1959) and Roe's (1956) classification systems, Meir and Ben-Yehuda (1976) found conflicting support but Westbrook and Molla (1976) found a high degree of similarity. Using Project TALENT data, McLaughlin and Tiedeman (1974) found career stability to be consistent through the Flanagan, Holland, and Roe occupational classification systems. This study is reported in full in the next section.

## TOSSING PROMISING PEBBLES INTO THE CURRENTLY CALM POND OF CAREER DEVELOPMENT RESEARCH

We have emphasized that a deep structure of theory in career development, particularly of the career development of males, has formed over the past 30 years. That deep structure presently determines the nature of the career development research now being reported. Our review of career development research reported in the past five years has just underscored the present undisturbed nature of that deep structure. Practically none of the research published during the past five years has had much influence on the deep structure of that theory.

In general, a single research study shouldn't be expected to create a scientific revolution overnight. However, in this section we look more closely at what we consider to be several promising studies among the recent additions to research in career development so that we can evaluate their potential effects more fully than we have done with the majority of studies reviewed in the preceding section.

Those studies which hold high potential for modifying research in career development are as follows:

Overview (of the cross sectional study of early career development as revealed by the National Assessment of Educational Progress) by David V. Tiedeman, Martin R. Katz, Anna Miller-Tiedeman, and Samuel H. Osipow.

Eleven-year stability and change as reflected in Project TALENT data through the Flanagan, Holland, and Roe occupational classification systems by Donald H. McLaughlin and David V. Tiedeman.

A social learning theory of career selection by John D. Krumboltz, Anita Mitchell, and G. Brian Jones.

Causal inference among variables related to career decision making: the chicken or the egg by Richard A. Kass, John R. Moreland, Vincent A. Harren and Howard E. A. Tinsley.

The above studies offer a diverse view of current research in career development. Two of the studies are based on probability samplings of the national population on which each is based. These studies include that based on the National Assessment of Educational Progress (NAEP) and that based on Project TALENT. In addition, the NAEP study illustrates what can be done about inferring developmental career effects from item sampling results on a national basis into an age and concept framework. The Project TALENT study offers one of the more exact available comparisons of the relative effectiveness of the Flanagan, Holland and Roe occupational classification systems.

The article on social learning theory is included to illustrate some of the more exacting statements of theory in career development which are entering the literature now that we are 25 to 30 years beyond the initial formulations which created an earlier revolution in the study of career. Current theory changes the study of career from the study of singular vocational events in life to the study of sets of occupational events in life. The chicken or the egg article illustrates some of the newer techniques which are being brought to bear upon older problems in career development theory. For instance, Super's formulations of theory in career development largely depend upon the assumption that career development evolves in the formation and crystallization of the self concept. Tiedeman and his colleagues, on the other hand, argue extensively for a more open system, one in which persons (1) progress through stages of development in a cyclic fashion, and, (2) by making the process ever more conscious, succeed in developing some mastery over making their careers happen rather than just letting them happen. The chicken or the egg paper throws some light on this distinction.

As you read the four articles which follow, think about their (1) topic or focus, (2) purpose, (3) method, (4) findings, and (5) implications for career development theory. In this way you will grow in your capacity to engage in the function of learning so that you can hierarchically restructure your understanding of career development theory.

## REVIEW REFERENCES

Adams, A. J., & Stone, T. H. Satisfaction of need for achievement in work and leisure time activities. *Journal of Vocational Behavior*, 1977, *11*, 174-181.

Ahrons, C. R. Counselors' perceptions of career images of women. *Journal of Vocational Behavior*, 1976, *8*, 197-207.

Alston, H. L., & Wakefield, J. A., Jr. Correspondence of constructs in Holland's theory for male and female college students. *Journal of Vocational Behavior*, 1976, *8*, 85-88.

American Institutes for Research. *National consortium on competency-based staff development (a series of modules).* Palo Alto, Calif.: American Institutes for Research, 1976.

AMEG Commission on Sex Bias in Measurement. A case history of change: A review of responses to the challenge of sex bias in career interest inventories. *Measurement and Evaluation in Guidance*, 1977, *10*, 148-152.

Andrews, H. A. Beyond the high point code in testing Holland's theory. *Journal of Vocational Behavior*, 1975, *6*, 101-108.

Arvey, R. C., & Gross, R. H. Satisfaction levels and correlates of satisfaction in the homemaker job. *Journal of Vocational Behavior*, 1977, *10*, 13-24.

Atlas, J. W. Career Planning needs of unemployed minority persons. *Journal of Employment Counseling*, 1978, *15*, 171-179.

Barnett, R. C. Sex differences and age trends in occupational preference and occupational prestige. *Journal of Counseling Psychology*, 1975, *22*, 35-38.

Barrett, T. C., & Tinsley, H. E. A. Vocational self-concept crystallization and vocational indecision. *Journal of Counseling Psychology*, 1977, *24*, 301-307. (a)

Barrett, T. C., & Tinsley, H. E. A. Measuring vocational self-concept crystallization. *Journal of Vocational Behavior*, 1977, *11*, 305-313. (b)

Baumgardner, S. R. The impact of college experiences on conventional career logic. *Journal of Counseling Psychology*, 1976, *23*, 40-45.

Becker, S. Personality correlates of the discrepancy between expressed and inventoried interests scores. *Measurement and Evaluation in Guidance*, 1977, *10*, 24-301.

Bergland, B. W., & Lundquist, G. W. The vocational exploration group and minority youth: An experimental outcome study. *Journal of Vocational Behavior*, 1975, *7*, 289-296.

Bobele, R. M., Alston, H. L., Wakefield, J. R., Jr., & Doughtie, E. B. A comparison of Holland's model using constructs measured by two different methods. *Journal of Vocational Behavior*, 1976, *9*, 245-250.

Borgen, F. H., & Seling, M. J. Expressed and inventoried interests revisited: Perspicacity in the person. *Journal of Counseling Psychology*, 1978, *25*, 536-543.

Brooks, L. Supermoms shift gears: Re-entry women. *The Counseling Psychologist*, 1976, *6*(2), 33-37.

Burlin, F. D. Locus of control and female occupational aspiration. *Journal of Counseling Psychology*, 1976, *23*, 126-129.

Campbell, J. Differential response for female and male law students on the Strong-Campbell Interest Inventory: The question of separate sex norms. *Journal of Counseling Psychology*, 1976, *23*, 130-135.

Campbell, R. E., Rodebaugh, H. D., & Shaltry, P. E. *Building comprehensive career guidance programs for secondary schools*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1978.

Chapman, W. *SIGI: Field test and evaluation of a computer-based system of interactive guidance and information*. Princeton, N.J.: Educational Testing Service, 1977.

Cochran, D. J., Hoffman, S. D., Strand, K. H., & Warren, P. M. Effects of client/computer interaction on career decision-making processes. *Journal of Counseling Psychology*, 1977, *24*, 308-312.

Cooper, J. F. Comparative impact of the SCII and the Vocational Card Sort on career salience and career exploration of women. *Journal of Counseling Psychology*, 1976, *23*, 348-352.

Crawford, J. D. Career development and career choice in pioneer and traditional women. *Journal of Vocational Behavior*, 1978, *12*, 129-139.

Creaser, J., & Carsello, C. Comparability of cross-sex scores on the Strong-Campbell Interest Inventory. *Journal of Counseling Psychology*, 1976, *23*, 360-364.

Crites, J. O. *Vocational psychology*. New York: McGraw-Hill, 1969.

Crites, J. O. A comprehensive model of career development in early adulthood. *Journal of Vocational Behavior*, 1976, *9*, 105-118.

Dawis, R. V., & Lofquist, L. H. Personality style and the process of work adjustment. *Journal of Counseling Psychology*, 1976, *23*, 55-59.

Dietrich, M. C. Work values evolution in a baccalaureate student nurse population. *Journal of Vocational Behavior*, 1977, *10*, 25-34.

Dillard, J. M. Relationship between career maturity and self-concepts of suburban and urban middle- and urban lower-class preadolescent black males. *Journal of Vocational Behavior*, 1976, *9*, 311-320.

Dipboye, R. L., & Wiley, J. W. Reactions of college recruiters to interviewee sex and self-presentation style. *Journal of Vocational Behavior*, 1977, *10*, 1-2.

Dixon-Altenor, C., & Altenor, A. The role of occupational studies in the career aspiration of black women. *Vocational Guidance Quarterly*, 1977, *3*, 211-215.

Donahue, T. J., & Costar, J. W. Counselor discrimination against young women in career selection. Journal of Counseling Psychology, 1977, *24*, 481-486.

Drier, H. N., Davis, H. M., Hartz, J. D., & Stein, W. *Career guidance, counseling, placement and follow-through program for rural schools*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1977. (ERIC Document Reproduction Service Nos. ED 142 750 through ED 142 764)

Dudley, G. A., & Tiedeman, D. V. *Career development: Exploration and commitment.* Muncie, Ind.: Accelerated Development, 1977.

Eden, D., & Jacobson, D. Propensity to retire among older executives. *Journal of Vocational Behavior*, 1976, *8*, 145-154.

Egner, J. R., & Jackson, D. J. Effectiveness of a counseling intervention program for teaching career decision-making skills. *Journal of Counseling Psychology*, 1978, *25*, 45-52.

Englehard, P. A., Jones, K. O., & Stiggins, R. J. Trends in counselor attitudes about women's roles. *Journal of Counseling Psychology*, 1976, *23*, 365-372.

Fabry, J., Blake, R., & Seran, G. A construct validation study of the ACT Interest Inventory with high school students. *Measurement and Evaluation in Guidance*, 1977, *10*, 233-236.

Fabry, J., & Poggio, J. P. The factor compatibility and communality of coded expressed and inventoried interests. *Measurement and Evaluation in Guidance*, 1977, *10*, 90-97.

Fishburne, F. J., Jr., & Walsh, W. B. Concurrent validity of Holland's theory for noncollege-degreed workers. *Journal of Vocational Behavior*, 1976, *8*, 77-84.

Fisher, T. J., Reardon, R. C., & Burck, H. D. Increasing information-seeking behavior with a model-reinforced videotape. *Journal of Vocational Behavior*, 1976, *23*, 234-238.

Flake, M. H., Roach, A. J., Jr., & Stennid, W. F. Effects of short-term counseling on career maturity of tenth grade students. *Journal of Vocational Behavior*, 1975, *6*, 73-80.

Fredrickson, R. H., Macy, F. U., & Vickers, D. Barriers to adult career change. *Personnel and Guidance Journal*, 1978, *57*, 166-168.

Fry, P. S. Changes in youth's attitudes toward authority: The transition from university to employment. *Journal of Vocational Behavior*, 1976, *23*, 66-74.

Gackenback, J. The effect of race, sex, and career goal differences on sex role attitudes at home and at work. *Journal of Vocational Behavior*, 1978, *12*, 93-101.

Ginzberg, E., Ginsburg, S. W., Axelrad, S., & Herma, J. L. *Occupational choice: An approach to a general theory.* New York: Columbia University Press, 1951.

Goldman, R. D., & Hewitt, B. M. The Scholastic Aptitude Test "explains" why college men major in science more often than college women. *Journal of Counseling Psychology*, 1976, *23*, 50-54.

Gould, R. F. *Transformations: Growth and change in adult life.* New York: Simon & Schuster, 1978.

Greenhaus, J. H., & Simon, W. E. Self-esteem, career salience, and the choice of an ideal occupation. *Journal of Vocational Behavior*, 1976, *8*, 51-58.

Greenhaus, J. H., & Simon, W. E. Career salience, work values, and vocational indecision. *Journal of Vocational Behavior*, 1977, *10*, 104-110.

Grimm, V. E., & Nachmias, C. The effect of cognitive style and manifest anxiety on intellectual and vocational interest in adolescents. *Journal of Vocational Behavior*, 1977, *10*, 146-155.

Gross, R. H., & Arvey, R. D. Marital satisfaction, job satisfaction and task distribution in the homemaker job. *Journal of Vocational Behavior*, 1977, *11*, 1-13.

Hall, D. T. Pressures from work, self, and home in the life stages of married women. *Journal of Vocational Behavior*, 1975, *6*, 121-132.

Hall, D. T., & Mansfield, R. Relationships of age and seniority with career variables of engineers and scientists. *Journal of Applied Psychology*, 1975, *60*, 201-210.

Hansen, J. I. C. Exploring new directions for Strong-Campbell Interest Inventory occupational scale construction. *Journal of Vocational Behavior*, 1976, *9*, 147-160.

Hansen, S. L., & Krierleber, D. L. Born free: A collaborative consultation model for career development and sex role stereotyping. *Personnel and Guidance Journal*, 1978, *56*, 395-399.

Hanson, G. R., & Rayman, J. Validity of sex-balanced interest inventory scales. *Journal of Vocational Behavior*, 1976, *9*, 279-291.

Harris-Bowlsbey, J. *Discover: A computer-based career guidance and counselor-administrative support system*. Westminster: The Discover Foundation, Western Maryland College, 1976.

Harris-Bowlsbey, J. Computer-based career guidance practices. In R. E. Campbell (Ed.), *Building comprehensive career guidance programs for secondary schools*. Columbus: The Vocational Center for Research in Vocational Education, The Ohio State University, 1978.

Hawkins, J. G., Bradley, R. W., & White, G. W. Anxiety and the process of deciding about a major and vocation. *Journal of Counseling Psychology*, 1977, *24*, 398-403.

Heath, D. H. Adolescent and adult predictors of vocational adaptation. *Journal of Vocational Behavior*, 1976, *9*, 1-19.

Hershenson, D. B., & Lavery, G. J. Sequencing of vocational development stages: Further studies. *Journal of Vocational Behavior*, 1978, *12*, 102-108.

Hodgson, M. L., & Cramer, S. H. The relationship between selected self-estimated and measured abilities in adolescents. *Measurement and Evaluation in Guidance*, 1977, *10*, 98-102.

Holcomb, W. R., & Anderson, W. P. Vocational guidance research: A five-year overview. *Journal of Vocational Behavior*, 1977, *10*, 341-346.

Holland, J. L. A theory of vocational choice. *Journal of Counseling Psychology*, 1959, *6*, 35-45.

Holland, J. L. The virtues of the SDS and its associated typology: A second response to Prediger and Hanson. *Journal of Vocational Behavior*, 1976, *8*, 349-358.

Holland, J. L., & Gottfredson, G. D. Using a typology of persons and environments to explain careers: Some extensions and clarifications. *The Counseling Psychologist*, 1976, *6*(3), 20-29.

Holland, J. L., Gottfredson, G. D., & Nafziger, D. H. Testing the validity of some theoretical signs of vocational decision-making ability. *Journal of Counseling Psychology*, 1975, *22*, 411-422.

Holland, J. L., & Holland, J. E. Vocational indecision: More evidence and speculation. *Journal of Counseling Psychology*, 1977, *24*, 404-414.

Holland, J. L., & Nafziger, D. H. A note on the validity of the Self-Directed Search. *Measurement and Evaluation in Guidance*, 1975, *7*, 259-262.

Holland, J. L., Takai, R., Gottfredson, G. D., & Hanau, C. A multivariate analysis of the effects of the Self-Directed Search on high school girls. *Journal of Counseling Psychology*, 1978, 25, 384-389.

Hollandsworth, J. G., Jr., Dressel, M. E., & Stevens, J. Use of behavioral versus traditional procedures for increasing job interview skills. *Journal of Counseling Psychology*, 1977, *24*, 503-510.

Horton, J. A., & Walsh, W. B. Concurrent validity of Holland's theory for college-degreed working women. *Journal of Vocational Behavior*, 1976, *9*, 201-208.

Howell, F. M., Frese, W., & Sollie, C. R. Ginzberg's theory of occupational choice: A reanalysis of increasing realism. *Journal of Vocational Behavior*, 1977, *11*, 332-346.

Jepsen, D. A. Occupational decision development over the high school years. *Journal of Vocational Behavior*, 1975, *7*, 225-237.

Johnson, R. W. Relationships between female and male interest scales for the same occupations. *Journal of Vocational Behavior*, 1977, *11*, 239-252.

June, L. N., & Pringle, G. D. The concept of race in career development theories of Roe, Super and Holland. *Journal of Non-White Concerns in Personnel and Guidance*, 1977, *6*, 17-23.

Kapes, J. T., & Strickler, R. E. A longitudinal study of changing work values between 9th and 12th grades as related to curriculum. *Journal of Vocational Behavior*, 1975, *6*, 81-93.

Katz, M., Norris, L., & Pears, L. Simulated occupational choice: A diagnostic measure of competencies in career decision-making. *Measurement and Evaluation in Guidance*, 1977, *10*, 222-231.

Kleinberg, J. L. Adolescent correlates of occupational stability and change. *Journal of Vocational Behavior*, 1976, *9*, 219-232.

Knefelkamp, L. L., & Slepitza, R. A cognitive-developmental model of career development — An adaptation of the Perry scheme. *The Counseling Psychologist*, 1976, *6*(3), 53-58.

Knefelkamp, L. L., Widick, C. C., & Stroad, B. Cognitive-developmental theory: A guide to counseling women. *The Counseling Psychologist*, 1976, *6*(2), 15-19.

Knell, S., & Winer, G. A. Effects of reading content on occupational sex role stereotypes. *Journal of Vocational Behavior*, 1979, *14*, 78-87.

Krivatsy, S. E., & Magoon, T. M. Differential effects of three vocational counseling treatments. *Journal of Vocational Behavior*, 1976, *23*, 112-118.

Krumboltz, J. D., Mitchell, A. M., & Jones, G. B. A social learning theory of career selection. *The Counseling Psychologist*, 1976, *6*(1), 71-81.

Kuhn, T. S. *The structure of scientific revolutions* (2nd ed.). Chicago: The University of Chicago Press, 1970.

Lawrence, W., & Brown, D. An investigation of intelligence, self-concept, socioeconomic status, race and sex as predictors of career maturity. *Journal of Vocational Behavior*, 1976, *9*, 43-52.

Levinson, D. J. *The seasons of a man's life*. New York: Knapp, 1978.

LoCascio, R., Nesselroth, J., & Thomas, M. The Career Development Inventory: Use and findings with inner city dropouts. *Journal of Vocational Behavior*, 1976, *8*, 285-292.

London, M., Crandall, R., & Seals, G. W. The contribution of job and leisure satisfaction to quality of life. *Journal of Applied Psychology*, 1977, *62*, 328-334.

Lunneborg, P. W. Vocational indecision in college graduates. *Journal of Counseling Psychology*, 1976, *23*, 402-404.

Lunneborg, P. W. Construct validity of the Strong-Campbell interest inventory and the vocational interest inventory among college counseling clients. *Journal of Vocational Behavior*, 1977, *10*, 187-195.

Lunneborg, P. W. Sex and career decision-making styles. *Journal of Counseling Psychology*, 1978, *25*, 299-305.

Malett, S. D., Spokane, A. R., & Vance, F. L. Effects of vocationally relevant information on the expressed and measured interests of freshman males. *Journal of Counseling Psychology*, 1978, *25*, 292-298.

Matthews, D. F., & Walsh, W. B. Concurrent validity of Holland's theory for non-college-degreed working women. *Journal of Vocational Behavior*, 1978, *12*, 371-379.

McGowan, A. S. Vocational maturity and anxiety among vocationally undecided and indecisive students: The effectiveness of Holland's self-directed search. *Journal of Vocational Behavior*, 1977, *10*, 196-204.

McLaughlin, D. H., & Tiedeman, D. V. Eleven-year career stability and change as reflected in Project TALENT data through the Flanagan, Holland, and Roe occupational classification systems. *Journal of Vocational Behavior*, 1974, *5*, 177-196.

McLure, G. T., & Piel, E. College-bound girls and science careers: Perceptions of barriers and facilitating factors. *Journal of Vocational Behavior*, 1978, *12*, 172-183.

Medvene, A. M., & Collins, A. M. Occupational prestige and appropriateness: The views of mental health specialists. *Journal of Vocational Behavior*, 1976, *9*, 63-71.

Medvene, A. M., & Shueman, S. A. Perceived parental attitudes and choice of vocational speciality area among male engineering students. *Journal of Vocational Behavior*, 1978, *12*, 208-216.

Meir, E. I., & Ben-Yehuda, A. Inventories based on Roe and Holland yield similar results. *Journal of Vocational Behavior*, 1976, *8*, 269-274.

Mendonca, J. D., & Siess, T. F. Counseling for indecisiveness: Problem-solving and anxiety-management training. *Journal of Counseling Psychology*, 1976, *23*, 339-347.

Miller-Tiedeman, A. *Individual career exploration*. Bensenville, Ill.: Scholastic Testing Service, 1976.

Miller-Tiedeman, A. *Individual career exploration: Picture form*. Bensenville, Ill.: Scholastic Testing Service, 1977.

Miller-Tiedeman, A., & Niemi, M. T. An "I" power primer: Part two: Structuring another's responsibility into his or her action. *Focus on Guidance*, 1977, *9*(8), 1-20.

Mount, M. K., & Muchinsky, P. M. Concurrent validation of Holland's hexagonal model with occupational workers. *Journal of Vocational Behavior*, 1978, *13*, 348-354.

Munley, P. H. Erik Erikson's theory of psychosocial development and vocational behavior. *Journal of Counseling Psychology*, 1975, *22*, 314-319.

Murphy, P. P., & Burck, H. D. Career development of men at mid-life. *Journal of Vocational Behavior*, 1976, *9*, 337-343.

*Native American Career Education Program*. San Francisco: Far West Lab for Educational Research and Development, 1977.

Nuelinger, J. *The psychology of leisure*. Springfield, Ill.: Charles C. Thomas, 1974.

Norris, L., Katz, M. R., & Chapman, W. *Sex differences in the career decision-making process*. Princeton, N.J.: Education Testing Service, 1978.

O'Brien, W. F., & Walsh, W. B. Concurrent validity of Holland's theory for non-college degreed black working men. *Journal of Vocational Behavior*, 1976, *8*, 239-246.

O'Bryant, S. L., & Corder-Bolz, C. R. The effects of television on children's stereotyping of women's work roles. *Journal of Vocational Behavior*, 1978, *12*, 233-244.

Oliver, L. W. The relationship of parental attitudes and parent identification to career and homemaking orientation in college women. *Journal of Vocational Behavior*, 1975, *7*, 1-12.

Oliver, L. W. Evaluating career counseling outcome for three modes of test interpretation. *Measurement and Evaluation in Guidance*, 1977, *10*, 153-161.

Omvig, C. P., & Thomas, E. G. Relationship between career education, sex, and career maturity of sixth and eighth grade pupils. *Journal of Vocational Behavior*, 1977, *11*, 322-331.

Omvig, C. P., Tullock, R. W., & Thomas, E. G. The effect of career education on career maturity. *Journal of Vocational Behavior*, 1975, *7*, 265-273.

Osipow, S. H. *Theories of career development* (2nd ed.). New York: Appleton-Century-Crofts, 1973.

Osipow, S. H. Vocational behavior and career development, 1975: A review. *Journal of Vocational Behavior*, 1976, *9*, 129-145.

Osipow, S. H., Carney, C. G., & Barak, A. A scale of educational-vocational undecidedness: A typological approach. *Journal of Vocational Behavior*, 1976, *9*, 233-243.

Peatling, J. H., & Tiedeman, D. V. *Career development: Designing self*. Muncie, Ind.: Accelerated Development, 1977.

Peoples, V. Y. Measuring the vocational interest of women. In S. H. Osipow (Ed.), *Emerging woman: Career analysis outlooks*. Columbus, Ohio: Charles E. Merrill, 1975.

Peters, J. P., & Hansen, J. C. *Vocational guidance and career development* (3rd ed.). New York: Macmillan, 1977.

Peterson, C., & Peterson, J. Issues concerning collaborating career. *Journal of Vocational Behavior*, 1975, *7*, 173-180.

Picou, J. S., & Campbell, R. E. *Career behavior of special groups: Theory, research, and practice.* Columbus, Ohio: Merrill Publishing Co., 1975.

Prediger, D. J., & Hanson, G. R. Holland's theory of careers applied to women and men: Analysis of implicit assumptions. *Journal of Vocational Behavior*, 1976, *8*, 167-184. (a)

Prediger, D. J., & Hanson, G. R. A theory of careers encounters sex: Reply to Holland (1976). *Journal of Vocational Behavior*, 1976, *8*, 359-366. (b)

Rayman, J. R. Sex and the single interest inventory: The empirical validation of sex-balanced interest inventory items. *Journal of Counseling Psychology*, 1976, *23*, 239-246.

Remenyi, A. G., & Fraser, B. J. Effects of occupational information on occupational perceptions. *Journal of Vocational Behavior*, 1977, *10*, 53-68.

Richardson, M. S. Self concepts and role concepts in the career orientation of college women. *Journal of Counseling Psychology*, 1975, *22*, 122-126.

Ridgeway, C. Parental identification and patterns of career orientation in college women. *Journal of Vocational Behavior*, 1978, *12*, 1-11.

Risser, J. J., & Tulley, J. E. *Pasadena City College SIGI project: Research study.* Pasadena, Calif.: Pasadena City College, 1977.

Roe, A. *The psychology of occupations.* New York: Wiley, 1956.

Roessler, R., Cook, D., & Lillard, D. Effects of systematic group counseling or work adjustment clients. *Journal of Counseling Psychology*, 1977, *24*, 313-317.

Rubinstein, M. R. Integrative interpretation of vocational interest inventory results. *Journal of Counseling Psychology*, 1978, *25*, 306-309.

Salomone, P. R., & Slaney, R. B. The applicability of Holland's theory to nonprofessional workers. *Journal of Vocational Behavior*, 1978, *13*, 63-74.

Schoon, C. G. Differences among medical, business, and engineering students in the intensity and direction of their affective responses to occupational concepts. *Journal of Vocational Behavior*, 1976, *9*, 169-178.

Scott, M. A. & Sedlacek, W. E. Personality differentiation and prediction of persistence in physical science and engineering. *Journal of Vocational Behavior*, 1975, *6*, 205-216.

Sedney, M. A., & Turner, B. E. A test of causal sequences in two models for development of career orientation in women. *Journal of Vocational Behavior*, 1975, *6*, 281-292.

Sell, M. V., Brief, A. P., & Aldag, R. J. Job satisfaction among married working women. *Journal of Employment Counseling*, 1979, *16*, 38-43.

Sheehy, G. *Passages.* New York: E. P. Dutton & Company, 1976.

Shinar, E. H. Sexual stereotypes of occupations. *Journal of Vocational Behavior*, 1975, *7*, 99-111.

Slaney, R. B. Expressed and inventoried vocational interests: A comparison of instruments. *Journal of Counseling Psychology*, 1978, *25*, 520-529.

Smart, J. C. Distinctive career orientations of Holland personality types. *Journal of Vocational Behavior*, 1976, *8*, 313-319.

Smith, E. J. Reference group perspectives and the vocational maturity of lower socioeconomic black youth. *Journal of Vocational Behavior*, 1976, *8*, 321-336.

Sorenson, J., & Winters, C. J. Parental influences on women's career development. In S. H. Osipow (Ed.), *Emerging woman: Career analysis and outlooks.* Columbus, Ohio: Charles E. Merrill, 1975.

Stake, J. E. Women's self-estimates of competence and the resolution of the career/home conflict. *Journal of Vocational Behavior*, 1979, *14*, 33-42.

Super, D. E. A theory of vocational development. *American Psychologist*, 1953, *8*, 185-190.

Super, D. E. *The psychology of careers*. New York: Harper & Row, 1957.

Terborg, J. R. Women in management: A research review. *Journal of Applied Psychology*, 1977, *62*, 647-664.

Thoresen, C. E., & Evart, C. K. Behavioral self-control and career development. *The Counseling Psychologist*, 1976, *6*(3), 29-43.

Tibbetts, S. L. Sex role stereotyping in the lower grades: Part of the solution. *Journal of Vocational Behavior*, 1975, *6*, 255-261.

Tiedeman, D. V., & Miller-Tiedeman, A. An "I" power primer: Part one: Structure and its enablement of intuition. *Focus on Guidance*, 1977, *9*(7), 1-16.

Tittle, C. K., & Denker, E. R. Kuder occupational interest survey profiles of reentry women. *Journal of Counseling Psychology*, 1977, *24*, 293-300.

Turner, R. G., & Horn, J. M. Personality correlates of Holland's occupational types: A cross cultural study. *Journal of Vocational Behavior*, 1975, *6*, 379-389.

United States Department of Health, Education and Welfare, Office of Education. *Monographs on career education (a series)*. Washington, D.C.: U.S. Government Printing Office, 1975, *et. seq*.

Villwock, J. D., Schnitzen, J. P., & Carbonari, J. P. Holland's personality constructs as predictors of stability of choice. *Journal of Vocational Behavior*, 1976, *9*, 77-85.

Wakefield, J. A., Jr., Yom, B. L., Doughtie, E. B., Chang, W. C., & Alston, H. L. The geometric relationship between Holland's personality typology and the Vocational Preference Inventory for blacks. *Journal of Counseling Psychology*, 1975, *22*, 58-60.

Waterman, A. S., & Waterman, C. K. Factors related to vocational identity after extensive work experience. *Journal of Applied Psychology*, 1976, *61*, 336-340.

Walsh, W. B., & Hanle, N. A. Consistent occupational preferences, vocational maturity, and academic achievement. *Journal of Vocational Behavior*, 1975, *7*, 89-97.

Westbrook, F. D. High scales on the SVID and the KOIS using Holland's occupational codes. *Journal of Counseling Psychology*, 1975, *22*, 24-27.

Westbrook, F. D., & Molla, B. Unique stereotypes for Holland's personality types, testing the traits attributed to men and women in Holland's typology. *Journal of Vocational Behavior*, 1976, *9*, 21-31.

Wexley, K. N., McLaughlin, J. L., & Sterns, H. L. A study of perceived need fulfillment and life satisfaction before and after retirement. *Journal of Vocational Behavior*, 1975, *7*, 81-87.

Wiener, Y., & Vaitenas, R. Personality correlates of voluntary midcareer change in enterprising occupations. *Journal of Applied Psychology*, 1977, *62*, 706-712.

Wiggins, J. D., & Weslander, D. Expressed vocational choices and later employment compared with vocational preference inventory and Kuder preference record-vocational scores. *Journal of Vocational Behavior*, 1977, *11*, 158-165.

Wijting, J. P., Arnold, C. R., & Conrad, K. A. Relationships between work values, socio-educational and work experiences, and vocational aspirations of 6th, 9th, 10th, and 12th graders. *Journal of Vocational Behavior*, 1977, *11*, 51-65.

Wijting, J. P., Arnold, C. R., & Conrad, K. A. Generational differences in work values between parents and children and boys and girls across grade levels 6, 9, 10, and 12. *Journal of Vocational Behavior*, 1978, *12*, 245-260.

Yanico, B. J. Sex bias in career information: Effects of language on attitudes. *Journal of Vocational Behavior*, 1978, *13*, 26-34.

Yen, F. B., & Healy, C. C. The effects of work experience on two scales of career development. *Measurement and Evaluation in Guidance*, 1977, *10*, 175-178.

Yom, B. L. Doughtie, E. B., Wei, N. C., Alston, H. L., & Wakefield, J. A., Jr. The factor structure of the Vocational Preference Inventory for black and white college students. *Journal of Vocational Behavior*, 1975, *6*, 15-18.

Yonge, G. D., & Regan, M. C. A longitudinal study of personality and choice of major. *Journal of Vocational Behavior*, 1975, *7*, 41-66.

Zener, T. B., & Schnuelle, L. Effects of the Self-Directed Search on high school students. *Journal of Counseling Psychology*, 1976, *23*, 353-359.

Zytowski, D. G. Predictive validity of the Kuder Occupational Interest Survey: A 12- to 19-year follow-up. *Journal of Counseling Psychology*, 1976, *23*, 221-233.

Zytowski, D. G., & Laing, J. Validity of other-gender-normed scales on the Kuder Occupational Interest Survey. *Journal of Counseling Psychology*, 1978, *25*, 205-209.

# Overview

DAVID V. TIEDEMAN
Northern Illinois University
MARTIN R. KATZ
Educational Testing Service
Princeton, New Jersey
ANNA MILLER-TIEDEMAN
DeKalb High School
DeKalb, Illinois
SAMUEL H. OSIPOW
The Ohio State University

## THE ASSESSMENT

National Assessment of Educational Progress (NAEP) was initiated in 1964 in response to need for a record of the outputs as well as the inputs of education. The project goals include collecting and reporting of information about specific educational achievements of young people in the United States, detecting and reporting of changes in that achievement, conducting of special studies into selected areas of educational achievement, and encouraging policy applications of the new data.

NAEP surveys the educational attainments of four milestone age groups: nines, thirteens, seventeens and adults (ages 26-35). Nines have been exposed to the basic program of primary education; thirteens have finished their elementary school program; and seventeens are completing the high school program. Seventeens also include a sample of out-of-school youth. Adults represent a group who have completed their formal education and have been away from school for a number of years.

Ten educational areas are assessed in five year cycles. These are: art, career and occupational development, citizenship, literature, mathematics, music, reading, science, social studies and writing. Each five-year cycle includes the following steps: development and review of objectives by subject matter specialists and educators, development and field testing of exercises to measure the objectives, administration of exercises to national samples at the four age levels, and data analysis and interpretation.

## THE OBJECTIVES

The survey of career and occupational development (COD) objectives which was administered during the 1973-74 school year used exercises to measure the following objectives and subobjectives:

1. Prepare for making career decisions
    - A. Know own characteristics relevant to career decisions
    - B. Know the characteristics and requirements of different careers and occupations
    - C. Relate own personal charac-

---

Reprinted with permission of the American Personnel and Guidance Association from *The cross-sectional study of early career development as revealed by the National Assessment of Education Progress*, 1979. DAVID V. TIEDEMAN is Professor and University Coordinator for the Office for Vocational, Technical and Career Education, Northern Illinois University, DeKalb, Illinois. MARTIN R. KATZ is with the Educational Testing Service, Princeton, New Jersey. ANNA MILLER-TIEDEMAN is with DeKalb High School, DeKalb, Illinois. SAMUEL H. OSIPOW is with the Ohio State University, Columbus, Ohio.

    teristics to occupational requirements
  - D. Plan for career development or change
- 2. Improve career and occupational capabilities
- 3. Possess skills that are generally useful in the world of work
  - A. Have generally useful numerical skills
  - B. Have generally useful communication skills
  - C. Have generally useful manual-perceptual skills
  - D. Have generally useful information-processing and decision-making skills
  - E. Have generally useful interpersonal skills
  - F. Have employment seeking skills
- 4. Practice effective work habits
  - A. Assume responsibility for own behavior
  - B. Plan work
  - C. Use initiative and ingenuity to fulfill responsibilities
  - D. Adapt to varied conditions
  - E. Maintain good health and grooming
- 5. Have positive attitudes toward work
  - A. Recognize the bases of various attitudes toward work
  - B. Hold competence and excellence in high regard
  - C. Seek personal fulfillment through own achievement
  - D. Value work in terms of societal goals

This is the total range of objectives used in the COD assessment. Not all sub-objectives were assessed for each age level. In addition, the released exercises interpreted here failed to include any items from subsections 4.B, 4.D, 4.E, or 5.B. Each publication in this publication series describes the specific sub-objectives assessed as necessary.

## THE EXERCISES

The development of the COD objectives and exercises was completed by the American Institutes for Research under contract with NAEP. The exercises were extensively reviewed and tested prior to the actual assessment, and were developed in consultation with educators, subject specialists and lay persons. The exercises are a unique aspect of NAEP. In addition to multiple choice items, NAEP uses other exercise formats such as open-ended questions and individual performance items.

In any NAEP assessment, one-half of the exercises are released to the public while one-half remain unreleased so that they can be used again in future assessments. This series reports only the results for the released career and occupational development exercises. Individuals who are interested in using the released exercises locally can obtain copies of the exercises and their scoring instructions by ordering the *Career and Occupational Development Technical Report: Exercise Volume* from: National Assessment of Educational Progress Education Commission of the States, 1860 Lincoln Street Suite 700, Denver, Colorado 80203.

## THE SURVEY

NAEP administers exercises to national samples at each age level. Exercises are administered in packages which contain several exercises and which can be administered in a reasonable time period. Packages are administered to a national sample which is stratified by region of the country, size of the community and socioeconomic level. About 100,000 respondents were sampled in the 1973-74 Survey of Career and Occupational Development. However, not all respondents took all exercises. For example, more than 35,000 Thirteens participated in the assessment but only 2,200-2,700 Thirteens responded to any one of the exercise packages. The total number of respondents included in each age group was as follows: Nines — 28,281; Thirteens — 38,289; Seventeens (in school) — 34,211; seventeens (out of school) — 994; and Adults — 2,138.

## THE DATA

The Career and Occupational Development Survey is an objective-referenced assessment. This means that the results are reported in percentages of the total group or specific sub-group which gave acceptable or otherwise categorized responses for a specific exercise related to a specific career and occupational development objective. No attempt is made to summarize overall performance for individuals. Objective-referenced results are helpful in providing insights into the current achievement levels of specific groups on each of the measured objectives.

The Early Career Development series reports P-values for various exercises. The P-values are weighted estimates of the total population percentages. Thus, for example, a statement that, "90% of Nines gave an acceptable response," means that 90% is an estimate of all the Nines in the United States who would have given an acceptable response if the total population had been assessed.

## THE EARLY CAREER DEVELOPMENT RESULTS

Figure 1 offers a condensed cross-sectional depiction of early career development as revealed by the 1973-74 National Assessment of Educational Progress. As indicated in the footnote to Figure 1, A denotes career and occupational behavior which is relatively absent in the age group. Quantitatively the letter A is used when the national incidence was zero percent or greater but less than 25 percent. A letter B reports that a behavior is moderately present, it being expected in 25 or greater percent of an age group but not as many as 50 percent of the age group. A letter C reports that a behavior has started to become reasonably entrenched, its incidence being in 50 percent or more of the age group in the nation but not as many as 75 percent of the group. A letter D indicates that a behavior has become fairly universal in the age group, it having appeared in 75 or more of the group. A letter X indicates that the exercise was not administered to the age group. In the subsequent interpretations of Figure 1, the terms, "relatively absent," "moderately present," "reasonably entrenched," and "relatively universal" denote each of these ranges respectively. Although an incidence of 51 percent in an age group qualifies as "reasonably entrenched" by definition, the reader might well question the depth of the behavior's entrenchment when it exists in only slightly more than a majority of an age group as later reported exactly in the remainder of this report. An overview without full detail exacts such a price in meaning.

The reader is due another note of caution before turning to the results. In fewer than 5 percent of the reports in Figure 1, percents close to boundaries were depicted in the same category as an adjoining age group in order not to suggest developmental change when age group differences were very small. For instance, an incidence of 47 percent among nines and 50 percent among thirteens will probably be recorded as two letter B's rather than as a letter B for the nines and a letter C for the thirteens. This conservative convention minimizes the developmental changes to which your attention will be drawn. Complete results are reported is subsequent chapters.

Finally, the specific questions are condensed in Figure 1 to provide meaningful impressions. Each question is explained in greater detail in subsequent chapters.

224

## FIGURE 1

A Condensed Cross-Sectional Depiction of Early Career Development

In this figure: A indicates an incidence of 0-24% for the age group. B indicates an incidence of 25-49% for the age group. C indicates an incidence of 50-74% for the age group. D indicates an incidence of 75-100% for the age group. X indicates that the exercise was not taken by the age group.

| | Age | | | |
|---|---|---|---|---|
| | 9 | 13 | 17 | A |
| I. PREPARE FOR MAKING CAREER DECISIONS | | | | |
| A. *Know Own Characteristics Relevant to Career Decisions* | | | | |
| 1. Talked seriously to someone about career plans? (101 002) | | | | |
| a. Yes | X | X | C | X |
| b. Who was consulted first? | | | | |
| 1) Peers | X | X | A | X |
| 2) Parents | X | X | B | X |
| 3) School counselor | X | X | A | X |
| 4) Other counselor | X | X | A | X |
| c. Person consulted was older | X | X | C | X |
| d. Person consulted was aware of abilities | X | X | C | X |
| e. Who was consulted at least once? | | | | |
| 1) Peer | X | X | B | X |
| 2) Parents | X | X | C | X |
| 3) Counselor | X | X | B | X |
| 4) Teacher | X | X | A | X |
| 5) Other adult | X | X | A | X |
| 2. Have you ever taken an aptitude test? (101 011) | | | | |
| a. Yes | X | X | B | X |
| b. Discussed with an advisor? (includes counselor) | X | X | A | X |
| B. *Know the Characteristics and Requirements of Different Careers and Occupations* | | | | |
| 1. Identify each of five common occupations (i.e. nurse, mailcarrier, secretary, service station attendant, newscaster) from functional descriptions (102 002) | D | D | X | X |
| 2. Name a job from a brief description (102 011) | | | | |
| a. Machinist | X | A | A | B |
| b. Architect | X | B | C | C |
| c. Teller | X | C | D | D |
| d. Locksmith | X | C | D | D |
| e. Baker | X | D | D | D |
| 3. Answer specific questions about specific jobs (102 013) | | | | |
| a. Each of 8 jobs (i.e. auto repairman, secretary, accountant, chemist, carpenter, social worker, watch repairman, secretary) | X | D | D | D |
| b. X-ray technician | X | A | A | B |
| 4. Knowledge of length of training required by at least four of five jobs (102 018) | X | X | B | C |

| | Age | | | |
|---|---|---|---|---|
| | 9 | 13 | 17 | A |
| 5. Correctly identifies earnings of at least 3 of 4 jobs (102 031) | X | B | C | D |
| 6. Main reasons a job promotion would be accepted (102 023) | | | | |
| a. Personal satisfaction | X | X | A | A |
| b. Challenging | X | X | A | A |
| c. Working conditions | X | X | A | A |
| d. Status and prestige | X | X | B | B |
| 7. Main reasons a job promotion would be refused (102 023) | | | | |
| a. Dislikes working conditions | X | X | A | A |
| b. Doesn't deserve it | X | X | A | A |
| c. Interpersonal reasons | X | X | A | A |
| d. Doesn't like new job | X | X | A | A |
| e. Too much responsibility | X | X | B | B |
| C. *Relate Own Characteristics to Occupational Requirements* | | | | |
| 1. Translating current interests into job requirements (103 002) | | | | |
| a. Believe they have such interests | X | C | C | X |
| b. What is it? | | | | |
| 1) Each of games, individual sports, musical or artistic abilities, hobbies and crafts, school or academic areas, household skills | X | A | A | X |
| 2) Group sports | X | B | A | X |
| c. For what job is it useful? | | | | |
| 1) Related or teaching it | X | A | A | X |
| 2) Professional doing same thing | X | B | B | X |
| d. How useful? | | | | |
| 1) Knowledge or experience in field | X | B | B | X |
| 2) Interest can help in the job | X | A | A | X |
| 2. If looking for a job: (103 003) | | | | |
| a. Can name two job-related skills they *have* | X | X | C | X |
| b. Can name two job-related skills they *lack* | X | X | B | X |
| c. Either of which is a specific skill/ability | X | X | B | X |
| D. *Plan for Career Development or Change* | | | | |
| 1. Have at least one school subject useful for a job? (104 003) | | | | |
| a. Yes | X | D | D | X |
| b. What subject? | | | | |
| 1) Each of science, English, the arts, social science, physical education, foreign language, industrial arts, home economics, vocational education | X | A | A | X |
| 2) Business education | X | A | B | X |
| 3) Mathematics | X | B | A | X |
| c. For what job? | | | | |
| 1) Professional in field named | X | A | A | X |
| 2) Teacher of field named | X | A | A | X |
| 3) At least vaguely related | X | C | C | X |

| | Age | | | |
|---|---|---|---|---|
| | 9 | 13 | 17 | A |
| 2. List 10 things to consider in choosing a job or career (104 009) | | | | |
| a. How many? | | | | |
| 1) All 10 acceptable | X | A | B | B |
| 2) At least 5 acceptable | X | C | D | D |
| b. What kind? | | | | |
| 1) Each of ethical considerations, possible discrimination, responsibilities, duties | X | A | A | A |
| 2) Each of job availability, status, interpersonal relations | X | A | B | B |
| 3) Each of job qualifications, personal abilities | X | B | B | B |
| 4) Personal satisfaction | X | C | D | C |
| 5) Working conditions | X | D | D | D |
| 3. Name 5 things to do now to find out more about a job you are interested in (104 011) | | | | |
| a. How many? | | | | |
| 1) At least one acceptable | X | C | C | X |
| 2) All 5 acceptable | X | A | A | X |
| b. How? | | | | |
| 1) Each of from school, teacher | X | A | A | X |
| 2) Counselor | X | A | B | X |
| 3) Each of reading or contacting employer | X | B | B | X |
| 4) People of field | X | B | C | X |
| 4. With regard to a job you would like to have in the future (104 015) | | | | |
| a. Have thought about it | X | D | D | X |
| b. Name up to 5 considered | | | | |
| 1) All 5 | X | A | A | X |
| 2) At least 3 | X | B | C | X |
| 3) At least 1 | X | D | D | X |
| c. Occupational category in which not interested? | | | | |
| 1) Each of 16 specific categories | X | A | A | X |
| 2) Professional | X | C | B | X |
| d. Name 3 things would like about job | | | | |
| 1) How many | | | | |
| a) All three | X | C | C | X |
| b) At least one | X | D | D | X |
| 2) What kind? | | | | |
| a) Each of responsibility, prestige, job availability, job qualifications, personal abilities | X | A | A | X |
| b) Helping people | X | C | A | X |
| c) Each of mechanical aspects, interpersonal relations | X | A | B | X |
| d) Duties | X | C | C | X |
| e. Name 3 things would *not* like | | | | |
| 1) How many? | | | | |
| a) All three | X | B | B | X |
| b) At least one | X | C | C | X |

|  | Age |  |  |  |
|---|---|---|---|---|
|  | 9 | 13 | 17 | A |
| 2) What kind? |  |  |  |  |
| a) Each of responsibility, helping people, prestige, job availability, job qualifications, personal abilities, interpersonal relations | X | A | A | X |
| b) Each of duties, mechanical aspects | X | B | B | X |
| f. Name 3 skills needed to do your desired job |  |  |  |  |
| 1) All three | X | B | B | X |
| 2) At least 1 | X | C | C | X |
| g. Three jobs using same skills/abilities |  |  |  |  |
| 1) All three | X | B | B | X |
| 2) At least 1 | X | C | C | X |
| 5. Employment experience and desires (104 016) |  |  |  |  |
| a. Now working full time | X | X | B | D |
| b. Things liked about a job |  |  |  |  |
| 1) Each of 31 things | X | X | A | A |
| 2) Each of working conditions, pay, interpersonal relations | X | X | B | B |
| c. Things disliked about a job |  |  |  |  |
| 1) Each of 37 things | X | X | A | A |
| 2) Working conditions | X | X | B | B |
| d. Something in work gave a sense of satisfaction |  |  |  |  |
| 1) Yes | X | X | C | D |
| 2) Each of 34 things | X | X | A | A |
| 3) Ability to produce a quality product | X | X | A | B |
| II. IMPROVE CAREER AND OCCUPATIONAL CAPABILITIES |  |  |  |  |
| A. Work is done to help out at home (200 002) | D | D | D | X |
| B. Kinds of sites visited (200 018) |  |  |  |  |
| 1. Newspaper plant | A | B | X | X |
| 2. Dairy, college, planetarium | B | C | X | X |
| 3. Factory, aquarium | C | D | X | X |
| 4. Farm, zoo, museum, airport, library | D | D | X | X |
| C. Lessons, training, or courses taken outside of regular school (200 016) |  |  |  |  |
| 1. Each of school or academic areas, an organization, group sports | A | A | A | X |
| 2. Each of individual sports, the arts | B | B | B | X |
| D. Activities done without help (200 019) |  |  |  |  |
| 1. Personal and family living activities |  |  |  |  |
| a. Care of persons |  |  |  |  |
| 1) Taken own temperature | B | C | X | X |
| 2) Baby sat | C | D | X | X |
| b. Home making |  |  |  |  |
| 1) Ironed clothes | C | D | X | X |
| 2) Each of changed sheets, washed dishes, washed windows | D | D | X | X |
| c. Cooking — each of baked cake, cooked complete meal | B | C | X | X |
| d. Sewing |  |  |  |  |
| 1) Made clothes for self | A | B | X | X |
| 2) Knit | B | B | X | X |
| e. Gardening | D | D | X | X |

| | Age | | | |
|---|---|---|---|---|
| | 9 | 13 | 17 | A |
| 2. Communicative activities | | | | |
| a. Ordered from a catalogue | B | B | X | X |
| b. Each of shopped, used library, card catalogue, written a report | C | D | X | X |
| c. Written a letter | D | D | X | X |
| 3. Technological activities | | | | |
| a. Maintenance | | | | |
| 1) Drawn a map | B | D | X | X |
| 2) Each of painted an object, put batteries in a flashlight | D | D | X | X |
| b. Construction | | | | |
| 1) Each of built or carved something of wood, made a toy | C | C | X | X |
| 2) Set the time on a clock | D | D | X | X |
| c. Innovation | | | | |
| 1) Each of inventing a game, designing something to make | C | C | X | X |
| III. POSSESS SKILLS THAT ARE GENERALLY USEFUL IN THE WORLD OF WORK | | | | |
| A. *Have Generally Useful Numerical Skills* | | | | |
| 1. Reasoning with numerical data presented in a display | | | | |
| a. Reading table of shoe sizes (301 019) | X | C | D | D |
| b. Reading a bar graph (301 005) — all three readings | X | B | B | B |
| c. Reading a floor plan (301 010) — all three readings | X | A | B | B |
| 2. Conversion from one scale to another | | | | |
| a. Identifying which of four fractions exceeds a stated decimal (301 011) | X | C | D | C |
| b. Conversions of minutes and seconds (301 033, 301 014) | | | | |
| 1) Minutes to seconds | C | D | D | D |
| 2) Seconds to minutes | A | B | C | C |
| c. Conversion of feet to inches (301 034, 301 014) | | | | |
| 1) Feet to inches | C | D | D | D |
| 2) Inches to feet | A | B | C | C |
| d. Conversions of pounds and ounces (301 035, 301 014) | | | | |
| 1) Ounces to pounds | B | D | D | D |
| 2) Pounds to ounces | A | C | D | D |
| e. Six correct conversions in b, c, & d | X | A | C | C |
| 3. Calculating | | | | |
| a. Calculating amount of finance charge paid in a two-year period (301 032) | X | A | B | C |
| B. *Have Generally Useful Communication Skills* | | | | |
| 1. Follow 3 street directions (302 010) | B | D | D | D |
| 2. Find telephone number from book within five minutes (302 020) | | | | |
| a. Within first minute | A | B | C | D |
| b. Within five minutes | B | D | D | D |

| | Age | | | |
|---|---|---|---|---|
| | 9 | 13 | 17 | A |
| 3. Addressing an envelope (302 015) — all six parts correct | B | D | X | X |
| 4. Fill out an order blank (302 005) — all six parts correct | X | C | D | D |
| 5. Discussion activities with organized groups within last 12 months (302 017) | | | | |
| a. Lead | X | X | B | B |
| b. Spoke or reported | X | X | C | B |
| c. Participated | X | X | D | C |
| d. All three | X | X | B | B |
| C. *Have Generally Useful Manual-Perceptual Skills* | | | | |
| 1. Read quantity of liquid depicted in a measuring cup (303 011) | B | D | D | D |
| 2. Determine lenght of a 3⅜ inch line (303 008) | B | C | D | D |
| 3. Sketching four objects in three dimensions (303 012) | | | | |
| a. Position, 3-dimensionality and size | X | A | A | A |
| b. Relative sizes | X | A | A | A |
| c. Position | X | B | B | A |
| d. 3-dimensionality | X | C | C | C |
| D. *Have Generally Useful Information-Processing and Decision-Making Skills* | | | | |
| 1. With respect to airlines limiting hiring of stewardesses to unmarried women between ages of 21 and 35 (304 001) | | | | |
| a. Recommends at least some liberalization of policy re sex | X | X | A | A |
| b. Recommends at least some liberalization of policy re age | X | X | B | B |
| c. Recommends at least some liberalization of policy re marriage | X | X | C | C |
| E. *Have Generally Useful Interpersonal Skills* | | | | |
| 1. Has helped another with school work (305 008) | D | D | D | X |
| 2. Offers at least one constructive way to help someone who speaks almost no English (305 009) | D | D | D | D |
| 3. After viewing a film showing a supervisor in action: (305 010) | | | | |
| a. Identify four of following things as *best* things supervisor did: organized task, explained task, helped employees with the task, polite, accepted suggestions, praised good work, utilized strong points | X | C | C | X |
| b. Identify four opposites of things in (a) as four *worst* things supervisor did | X | C | C | X |
| F. *Have Employment-Seeking Skills* | | | | |
| 1. List five acceptable kinds of part-time work people your age do to earn money in or near your town (306 006) | X | C | C | X |
| 2. In relation to an advertisement: (306 009) | | | | |
| a. Letters of application were written for salesperson | X | X | B | B |
| b. Letters of application were written for apprentice mechanic | X | X | B | B |

|  | Age |  |  |  |
|---|---|---|---|---|
|  | 9 | 13 | 17 | A |
| c. Letters of application were written for office helper | X | X | B | B |
| d. In their letters, respondents formatted correctly |  |  |  |  |
| 1) Return address | X | X | A | A |
| 2) Date, inside address | X | X | B | B |
| 3) Greeting, closing, signature | X | X | D | D |
| e. In their letters, respondents correctly handled mentioning of: |  |  |  |  |
| 1) References, reason(s) for wanting job | X | X | A | A |
| 2) Interview | X | X | A | B |
| 3) Contact | X | X | B | B |
| f. In their letters, respondents: |  |  |  |  |
| 1) Described the job correctly | X | X | D | D |
| 2) Described their qualifications |  |  |  |  |
| a) By including relevant personal qualities | X | X | A | A |
| b) By correctly including their high level qualifications | X | X | D | D |
| IV. PRACTICE EFFECTIVE WORK HABITS |  |  |  |  |
| A. *Assume Responsibility for Own Behavior* |  |  |  |  |
| 1. When going to the store to get bread for mother, Mary is stopped by Tom, they talk so long the store closes, and Mary returned without the bread (401 003) Fault was ascribed to |  |  |  |  |
| a. Mary for talking too long | A | A | X | X |
| b. Tom for talking too long or for not letting Mary leave | B | A | X | X |
| c. No one because Mary didn't want to be rude | A | A | X | X |
| 2. With respect to an injury you inflict on another while operating a factory machine without safety shield in place as required, respondent: (401 009) |  |  |  |  |
| a. Accepts responsibility for accident | X | X | D | X |
| b. Offers an acceptable reason for responsibility | X | C | D | X |
| 3. In trying to get an unfair rule changed, would do: (004 103) |  |  |  |  |
| a. Each of obey, talk it over with a peer or with someone without authority, protest or petition, enlist the aid of one's representative | A | A | X | X |
| b. Discuss with someone in authority | B | B | X | X |
| C. *Use Initiative and Ingenuity to Fulfill Responsibilities* |  |  |  |  |
| 1. Does each of three things correctly in folding and stapling two sheets of paper to conform to a model (403 004) | D | D | X | X |
| 2. Would ask question of a teacher if failed to understand what had to be completed tomorrow (403 005) | C | D | X | X |
| 3. Correctly identifies one of four *least* worthwhile questions to ask a supervisor discussing a new rush manufacturing order (403 010) | X | X | D | D |
| V. HAVE POSITIVE ATTITUDES TOWARD WORK |  |  |  |  |
| A. *Recognize the Bases of Various Attitudes Toward Work* |  |  |  |  |

| | Age | | | |
|---|---|---|---|---|
| | 9 | 13 | 17 | A |
| 1. Names each of the following as one of six reasons why people willing to work find it hard to get work: (501 009) age, race, sex, appearance, personality/manners | X | A | A | A |
| 2. Can a person like a repetitive job? (501 011) | | | | |
| a. Yes | X | X | B | C |
| b. For each of the following reasons: likes it, likes pay, likes routine, likes associates, likes material used, likes mental aspects, satisfied if doing job well, only job could get | X | X | A | A |
| C. *Seek Personal Fulfillment Through Own Achievements* | | | | |
| 1. Believe that following should finally decide on the work one should do for a living (503 011) | | | | |
| a. Each of parents or respondent and parents, persons other than parents or respondent and others | A | A | A | X |
| b. Respondent alone | B | C | C | X |
| 2. If a millionaire, respondent would enjoy (503 012) | | | | |
| a. Building houses or gardening | B | B | X | X |
| b. Raising race horses | C | C | X | X |
| c. Giving to charity | C | D | X | X |
| d. Each of traveling, learning new things | D | D | X | X |
| D. *Value Work in Terms of Societal Goals* | | | | |
| 1. Child labor laws should be continued: (504 005) | | | | |
| a. Yes | X | B | C | X |
| b. For each of the following reasons: | | | | |
| 1) To protect children's physical and emotional well being, to let them gain education unencumbered by work, and because they are not qualified to work | X | A | B | B |
| 2) Children easily exploited by parents and employers, and to allow more adults to be employed | X | A | A | A |

## PREPARE FOR MAKING CAREER DECISIONS

### A. Know Own Characteristics Relevant to Career Decisions

Talk about career plans becomes moderately entrenched in seventeens. As might be expected, parents are moderately likely to be the first consulted about career plans but are pretty generally consulted sometime. Counselors and peers are moderately likely to be consulted at least once but whoever is consulted is pretty generally likely to be older than the respondent.

Surprisingly, the incidence of having taken an aptitude test is only moderately present among seventeens and its discussion with an advisor is practically non-existent. It doesn't appear that counselors universally figure in Americans' career planning.

### B. Know the Characteristics and Requirements of Different Careers and Occupations

Identification of common occupations is rather universal even among nines. Identification of a job from a brief description tends to become more universal later than nine. There is a gradient of universality depending on the job. Bakers, locksmiths and tellers are universally identified by seventeen, but architects and machinists are less frequently identified even by adults.

Except for x-ray technician, which is never more than moderately associated with specific statements about it, thirteens, seventeens, and adults pretty universally are able to answer specific questions about specific jobs which are in public awareness quite a bit. This knowledge even extends in less of the population and at a later time in development to knowledge of lengths of training and the specific earnings of many of these visible jobs.

Only status and prestige along with heavy responsibility are moderately present as reasons why respondents would accept or refuse a job promotion respectively. It appears that even among seventeens and adults, there are no universal values which Americans follow in the pursuit of that elusive thing called job progress.

Surprisingly, there seems to be a fair amount of occupational knowledge seeded among the American population. Although we must be selective in our application of this result, the result does suggest that some diminution of excessive doses of occupational information might be in order for some Americans.

## C. Relate Own Characteristics to Occupational Requirements

An important career skill is the capacity to translate one's own characteristics into occupational requirements so that each individual can find employment in which satisfaction and success coexist. Despite numerous efforts to do this for persons, we still haven't found a foolproof means of doing so. Hence it is of interest to see the degree to which this skill is developed.

Notice that belief that one has an interest is fairly universally entrenched at thirteen. However, except for group sports which is moderately present as an interest among thirteens, most of the interests named occur with slight incidence and are rather general to home and school activities. In addition, the translation skill hasn't matured in many Americans even by seventeen. The translations of interests to jobs are moderately present only with an association of being a professional in the same thing in which one is interested, and the reason why the interest can be useful is largely limited to indicating that it offers some relevant knowledge and experience in the field. With adults, these relational skills are moderately entrenched in terms of naming two job-related skills they have and dwindles to being only moderately present in the identification of two job-related skills they lack, either of which is a specific skill or ability.

## D. Plan for Career Development or Change

A cursory glance at the released exercises of this sub-section should quickly point out the similarity of the skills assessed here to those assessed in the prior sub-section. This time, however, the interest-to-possibility translation has been extended to the skills involved in planning for taking a job. Note that there are five questions dealing with (1) the translation of school subjects into job possibilities, (2) the listing of factors of relevance to job choice, (3) indicating how to learn more about jobs in which one is interested, (4) indicating how far one has gone in job planning, and (5) the status of first-hand job familiarity among seventeens and adults.

At thirteen and seventeen, respondents almost universally believe they have studied at least one school subject which will be useful in a job. The subject is business education which occurs with moderate incidence among seventeens and mathematics which occurs with the same moderate incidence among thirteens. However, respondents at these ages

233

can only vaguely relate their school subjects to job requirements.

Seventeens and adults can name ten things acceptable in the choice of a job with moderate incidence, and at least five universally. Thirteens are a category below these incidences in each instance. Working conditions are almost universally named at all three ages with personal satisfaction being reasonably entrenched as well. The remaining things occur with less incidence.

Thirteens and seventeens aren't very likely to name five acceptable things they can do now to find out about a job in which they are interested, but the capacity to name at least one acceptable thing is reasonably entrenched in both age groups. Counselors are named as a source of such information in only moderate incidence among seventeens, while thirteens seldom identify counselors as an information source. Fortunately, people in the field are reasonably entrenched as an information source by seventeen.

Thirteens and seventeens have fairly universally thought about a job they would like to have in the future and can name at least one such job. However, the capacity to name as many as five such jobs is practically absent in both age groups. Naming three jobs seems to be the extent of this capacity in a moderate proportion of thirteens and in a more entrenched proportion of seventeens. Professional jobs are reasonably likely to be included as one of the three jobs considered. The remainder of exercise 4 indicates that job thinking has become slightly differentiated in moderate to entrenched proportions of thirteens and seventeens in the United States. This differentiation extends to being able to name three things they would like about a considered job, as well as three things they would not like. They can also reasonably frequently name three skills needed to do a desired job as well as three jobs which use the same skills or abilities.

Finally, exercise 5 reports the employment experience and desires of seventeens and adults. A moderate proportion of seventeens are working full time but adults are almost universally working. A sense of satisfaction with work was reasonably entrenched among seventeens and almost universally present among adults. The specific things which seventeens and adults like and dislike about a job or which gave them a sense of satisfaction from work were so variable that the incidence of each one of them was practically non-existent. The most frequently mentioned ones were working conditions, pay, and interpersonal relations as liked in a job; working conditions as disliked in a job; and ability to produce a quality product as something which gave a sense of satisfaction at work.

## Summary

The emerging picture so far, then, appears to be that Americans don't confer much with counselors about career plans, do have a fair amount of common occupational knowledge, but even as adults don't have well developed skills for translating who they are and what they have done into what they might do. This latter observation needs tempering by realization that, with regard to job planning, at least by seventeen, Americans have developed a few capacities which help them translate their school experience into job planning. The differentiated circumstances at this time are that a handful of jobs have been considered and respondents know some means of getting further information. Finally, Americans are pretty universally at work as adults and report that their work does give them a sense of satisfaction. Such an observation should make us wonder about how much career counseling children, adolescents, and young adults actually need. However, when only the very faint indications of differentiated career skills emerge as they do in these NAEP data, they should really whet the appetites of those career counselors who seek to develop career relevant skills. These data indicate the large amount of room left for further education in translating interests into job possibilities and the further differentiation of job planning skills.

## IMPROVE CAREER AND OCCUPATIONAL CAPABILITIES

Youths undertake numerous activities which improve their career and occupational capabilities. Almost universally, nines, thirteens, and seventeens report that they have worked around home to help out. Nines and thirteens also almost universally visit farms, zoos, museums, airports, libraries, factories, and aquaria although it is a somewhat moot point about how much career skill and focus such visits have provided. Only a small proportion of nines, thirteens, and seventeens have taken lessons, training, or courses outside of school except for individual sports and the arts which are taken by a moderate proportion of each age group. Hence, even their direct learning activities still don't have too much significance for career skills and development. However, with regard to common activities done at and around home, the data suggest that most personal and family living, gardening, communication, maintenance, construction, and innovation activities are pretty well entrenched among nines and thirteens.

Chores, common activities, visits, and lessons abound among American youths. These activities can form the basis of career skill and development if focused with such purposes in mind as they occur or relatively soon afterwards.

## POSSESS SKILLS THAT ARE GENERALLY USEFUL IN THE WORLD OF WORK

### A. Have Generally Useful Numerical Skills

Conversions of minutes to seconds, feet to inches, and ounces to pounds become and remain almost universal by thirteen. Conversions in the reverse direction which ordinarily involve fractions and division only become entrenched by about seventeen and persist at only this level with adults. Reading tables of shoe sizes becomes almost universal by seventeen, but reading bar graphs and floor plans remains no more than moderately present among thirteens, seventeens and adults. Calculating the amount of a finance charge paid over a two year period progresses from being almost absent through moderately present to reasonably firmly entrenched from thirteen to adult years.

It appears, then, that generally useful numerical skills emerge in the order of conversion from one to another metric, to reasoning with numerical data presented in a display, and on to simple calculating. All these skills are reasonably well entrenched among adults.

### B. Have Generally Useful Communication Skills

Following simple street directions, finding a telephone number in a book within five minutes, and addressing an envelope are generally useful communication skills which are almost universally present in the United States population at thirteen. However, finding that number in the telephone book within only one minute doesn't become universal until adult age.

Participation in discussion with organized groups is reasonably entrenched by seventeen, as is speaking or reporting. However, leading a group is only moderately present in both seventeens and adults.

### C. Have Generally Useful Manual-Perceptual Skills

Reading the quantity of a liquid depicted in a measuring cup is an almost universal skill by thirteen. Determining the length of a 3⅜ inch line is firmly entrenched at thirteen but doesn't become almost universal until seventeen. Representing the three dimensionality of a four-object model is reasonably entrenched at thirteen as well and never becomes almost universal among adults. Representing the position and relative sizes of the four objects is a less proportionately available skill, although position representation is moderately found among thirteens and seventeens.

### D. Have Generally Useful Information-Processing Skills

When confronted with a problem of recommending the liberalization of an airline hiring policy restricting the hiring of stewardesses to that of unmarried females between 21 and 35 years of age, at least liberalization of the marriage restriction is reasonably firmly entrenched among seventeens and adults. However, liberalization of the age policy is to be found in only a moderate proportion of these age groups and liberalization of the sex limitation is practically never recommended. It appears that seventeen-year old and adult Americans like female stewardesses, would prefer them young but don't worry as much about whether they are married or not.

### E. Have Generally Useful Interpersonal Skills

Persons in the United States seem almost universally to have helped another with school work from age nine on. They also almost universally offer at least one constructive way to help someone who speaks almost no English from that age on as well. Finally, after viewing a film showing a supervisor in action with workers, the capacities to identify four things which the supervisors did best and worst each are also reasonably entrenched among thirteens and seventeens. It appears, then, that in these relatively simple interpersonal skills, most Americans have them from age thirteen on.

### F. Have Employment-Seeking Skills

Knowledge of five kinds of part-time work which people at ages thirteen and seventeen do to earn money is reasonably entrenched in these age groups. In writing a letter applying for a job in response to an advertisement, seventeen-year old and adult respondents are about equally split among applying for the jobs of salesperson, apprentice mechanic, and office helper. The letters which they write are almost universally accurately formatted with regard to greetings, closing, and signature, but the date, inside address, and return address are done accurately in only moderate proportions or less of the age group. The same proportions held with regard to substantive essentials such as including names of persons from whom references could be obtained, asking for an interview, and indicating how the potential employer might contact the applicant. However, seventeens and adults do almost universally mention their high level qualification as well as describe the job accurately. Relevant personal qualities are practically never mentioned.

It appears, then, that Americans as young as thirteen know about nearby part-time job opportunities but that even seventeens and adults have difficulty in applying for a job when it comes to including personal material and the meat and potatoes of presenting themselves in a job-getting light.

### Summary

Americans seem to possess a fair quantity of the simple skills which are generally useful in preparing for the world of work.

Converting from one to another

metric is reasonably entrenched by seventeen when the capacity to reverse direction is also included. Reading tables and bar graphs has a similar incidence by a similar age. Simple calculating doesn't become reasonably firmly entrenched until adult life and then only when the skill remains one which continues to be of direct use in living after leaving school.

Participating in discussions within groups is also reasonably entrenched by seventeen along with speaking and reporting.

Reading the liquid levels in a graduated container, measuring the length of a line and representing the three-dimensionality of a model are all reasonably entrenched by thirteen and mature further by seventeen.

Seventeen-year old and adult Americans like female stewardesses, would prefer them young but don't mind their being married. Elimination of sex and age discrimination resident in the policy of hiring airline stewardesses therefore doesn't seem to be an act that would meet with popular appeal in the United States.

From age thirteen on, most Americans have rudimentary interpersonal skills such as knowing how to help another and knowing what work supervisors do well and poorly.

If the skills tested in the NAEP be likened to those of literacy, these data indicate that American adults are generally literate with regard to simple numerical, communication, manual-perceptual, information-processing, interpersonal, and employment-seeking skills. Incidences of these skills largely change after thirteen or seventeen years of age. However, when the simplicity of the skills tested is gauged against the complexity of today's world, it appears that simple career skill literacy is insufficient for daily life. These data suggest to counselors that, while work remains before them in making simple career skill literacy universal, vistas lie before them in facilitating the more complex self and career development skills which they favor.

## PRACTICE EFFECTIVE WORK HABITS

### A. Assume Responsibility for Own Behavior

The most basic career skill is a fully developed capacity to differentiate what one causes in one's environment and to take appropriate responsibility for that which one does cause. The NAEP data indicate that less than 50 percent of nines and thirteens take responsibility for what they cause or would take very effective steps to get an unfair rule changed. On the other hand, seventeens and adults almost universally say they would assume responsibility for an accident they caused at work which injured another. It appears, then, that there may be a break in the capacity to differentiate and own what one causes which occurs between thirteen and seventeen.

### B. Use Initiative and Ingenuity to Fulfill Responsibilities

Nines and thirteens almost universally correctly construct a simple object following a model. Thirteens also almost universally say they would ask a teacher if they had an assignment they had to turn in tomorrow and hadn't understood what it was to be. Seventeens and adults also almost universally identify the correct of four least worthwhile questions to ask when consulted by a supervisor about getting out a new rush manufacturing order. It appears, then, that initiative exists fairly universally in the forms and at the ages tested in NAEP.

### Summary

Responsibility for one's own behavior and its consequences might spurt between thirteen and seventeen. On the other hand, initiative progresses to almost universal proportion from nine to thirteen to seventeen in terms of imitating a simple model in con-

237

struction, inquiring when stuck on an assignement, and inquiring when having to plan a more complex manufacturing task.

## HAVE POSITIVE ATTITUDES TOWARD WORK

### A. Recognize the Bases of Various Attitudes Toward Work

Thirteens, seventeens, and adults recognize age, race, sex, appearance, and personality/manners in about equal proportion as one of six reasons why people who want to work find it hard to get work. Also the attitude that one can like a repetitive job is reasonably entrenched among adults but not seventeens. Seventeens and adults give acceptable reasons for the liking of repetitive jobs in about equal proportions as well. It appears, then, that discriminatory hiring practices are known by thirteen but that understanding why persons continue in repetitive work doesn't become highly visible in the population until the adult age.

### B. Seek Personal Fulfillment Through Own Achievements

Declaring only one's self as responsible for finally deciding what work one should do becomes reasonably entrenched by thirteen. Raising race horses, giving to charity, traveling, and learning new things become reasonably entrenched or almost universal at nine within the fantasy of being a millionaire.

### C. Value Work in Terms of Societal Goals

Thirteens, seventeens, and adults advance steadily toward virtual universality in adult years of the belief that child labor laws should be continued. A moderate number of seventeens and adults believe that these laws should be continued to protect the well being of children, to let them gain an education unencumbered by work, and because children are not qualified for work. There is a relative absence in all three age groups of belief that the laws should be continued because parents or employers exploit children and because keeping children from working allows more adults to be employed.

### Summary

Discriminatory hiring practices and justifications of child labor laws are reasonably understood by a majority of thirteens and beyond. Learning new things if one had money to do so is elected as a possibility among a majority of nines and finally deciding what work one should do by one's self becomes reasonably entrenched by thirteen but understanding why persons continue in repetitive work doesn't entrench reasonably firmly until adult years.

## OVERALL SUMMARY

Although Americans almost universally report themselves at work as adults and also report that their work does give them a sense of satisfaction, there is still a lot that remains to be done in preparing youths and young adults for making career decisions. Results indicate that Americans don't confer with counselors much about their career plans. Americans do have a reasonable amount of very common occupational knowledge but they lack skill in translating their interest into job possibilities. However, at least by seventeen, Americans do have an initially differentiating career planning field which includes knowledge of three or more jobs and an awareness of how to go about getting job knowledge when needed.

Chores, common activities, visits, and lessons abound among American youths. These activities can form the basis of career skill and development if focused with such purposes in mind as they occur or relatively soon afterwards. The results of the prior section suggest that such focusing is not likely to occur without deliberate attention being given to it beyond that which existed in 1973-74.

If the career skills tested in the NAEP be likened to those of literacy, the data on skills generally useful for work indicate that the American adults are generally literate with regard to simple numerical, communication, manual-perceptual, information processing, interpersonal, and employment-seeking skills. Incidences of these skills largely change after thirteen or seventeen years of age. However, when the simplicity of these skills is gauged against the complexity of today's world, it appears that simple career skill literacy is insufficient for daily life. These data suggest to counselors that, while work still remains before them in making simple career skill literacy universal, vistas lie before them in facilitating the more complex self and career development skills which they favor and society needs.

The highly critical career skill of differentiating and assuming responsibility for what one causes in one's environment acts like it spurts up between thirteen and seventeen. On the other hand, initiative progresses to almost universal proportion from nine to thirteen to seventeen in terms of initiating a simple model in construction, inquiring when stuck on an assignment, and inquiring when having to plan a more complex manufacturing task.

Finally, discriminatory hiring practices and justification of child labor laws are reasonably understood by a majority of thirteens and beyond. Learning new things if one had money to do so is elected as a possibility among a majority of nines and finally deciding what work one should do by one's self becomes reasonably entrenched by thirteen but understanding why persons continue in repetitive work doesn't entrench reasonably firmly until adult years as does understanding why child labor laws need continuation as well.

It appears then that the rudimentary look at early career development which the reader can take through this National Assessment of Educational Progress creates plenty of grist for a career counselor's mill. The NAEP results more than adequately testify to how little the counselor presently figures in career development as well as to how little personal responsibility and capacity for career has developed by seventeen to say nothing of the adult years from 26-35 as well. Although the American people may have a basic existential career literacy, they remain children in the groves of career development.

## THE SUB-POPULATIONS

The survey was administered to a national sample of each of the four age level groups as noted earlier. However, data analyses were completed not only for the total national group at each level but also for several sub-populations. These sub-populations are:

*Sex:* Results are presented for males and females.

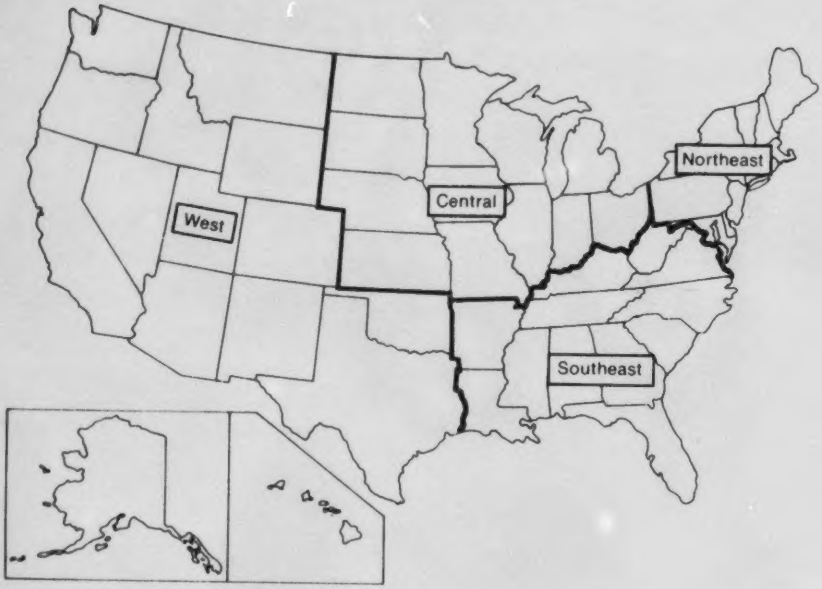
*Race:* Results are reported for blacks and whites.

*Region:* The country has been divided into four regions: northeast, southeast, central and west. The states that are included in each region are shown in Figure 2.

*Parent Education:* Four categories of parental education are defined by NAEP. These categories include: (1) No-HS — Those whose parents have had no high school education; (2) Some-HS — those who have at least one parent with some high school education; (3) Grad-HS — those who have at least one parent who graduated from high school; and (4) Post-HS — those who have at least one parent who has had some post high school education.

*Size and Type of Community:* Community types are identified both by the size of the community and by the type of employment of the majority of people in the community. These include: (1) HM — areas in or around cities with a population greater than 200,000 where a high proportion of

FIGURE 2
National Assessment of Geographic Regions



the residents are in professional or managerial positions; (2) LM — areas in or around cities with a population greater than 200,000 where a high proportion of the residents are on welfare or are not regularly employed; (3) ER — areas with a population under 10,000 where most of the residents are farmers or farm workers; (4) UF — communities within the metropolitan area of a city with a population greater than 200,000 outside the city limits and not in the high or low metro group; (5) MBC — communities within the city limits of a city with a population over 200,000 and not included in the high or low metro groups; (6) MC — city with population between 25,000 and 200,000; and (7) SP — communities with a population of less than 25,000 and not in the extreme rural group.

The analyses of responses generally include not only national percentages for each age group but also percentages for sub-populations that differ significantly from the complete age group. Standard errors were computed for each sub-group P-value, and a sub-group is considered to be significantly different if the obtained difference between the sub-group and the total group is at least twice as large as the estimate of the sub-group standard error. This Story of Early Career Development will often report these differences in such statements as, "Females scored higher than the age group as a whole." It is important to note, however, that when these sub-group differences are reported, the causes for the differences in achievement levels cannot be ascribed solely to membership in a particular group. Indeed, age group differences cannot be reported as independent, since each respondent is a member of five different sub-groups. Furthermore, it would be tedious to report every difference that is statistically significant, especially when a difference does not appear to be substantively important or interpretable. The authors have, therefore, exercised individual discretion in reporting subgroup differences, but for the most part, the reader can presume that the absence of a P-value in a cell of a table signifies that the value was not significant. In such cases, the P-value reported for the nation as a whole is the one which prevails, with just chance variation, in the sub-population in which the P-value is absent.

## OTHER COD ASSESSMENT RESOURCES

### NVGA-AMEG Series

This publication is one in a series of publications developed by the NVGA-AMEG Commission on National Assessment with support from the National Advisory Council on Career Education and the National Assessment Project. These publications are available from: Publication Sales, American Personnel and Guidance Association, 1607 New Hampshire Avenue, N.W., Washington, D.C. 20009. Publications in this series include:

Tiedeman, D. V.; Katz, M. R.; Miller-Tiedeman, A.; and Osipow, S. H. *Cross-Sectional Story of Early Career Development as Revealed by the National Assessment of Educational Progress.* Washington, D.C. National Vocational Guidance Association, and Association for Measurement and Evaluation in Guidance, 1978. (order #72219) $7.75 APGA members; $8.75 non-members

Miller, J. M., *Career Development Needs of Nine-Year Olds: Implications for Career Development Programs.* Washington, D.C.: National Vocational Guidance Association, and Association for Measurement and Evaluation in Guidance, 1978. (order #72215) $3.25 APGA members; $4.25 non-members

Aubrey, R. F., *Career Development Needs of Thirteen-Year Olds: Implications for Career Development Programs.* Washington, D.C.: National Vocational Guidance Association, and Association for Measurement and Evaluation in Guidance, 1978. (order #72216) $4.25 APGA members; $5.25 non-members

Mitchell, A. H., *Career Development Needs of Seventeen-Year Olds: Implications for Career Development Programs.* Washington, D.C.: National Vocational Guidance Association, and Association for Measurement and Evaluation in Guidance, 1978. (order #72217) $4.75 APGA members; $5.75 non-members

Westbrook, B. W., *Career Development Needs of Adults: Implications for Career Development Programs.* Washington, D.C.: National Vocational Guidance Association, and Association for Measurement and Evaluation in Guidance, 1978. (order #72218) $2.75 APGA members; $3.75 non-members

### NAEP Series

The NAEP project has also developed several reports related to the COD assessment. These are available from: National Assessment of Educational Progress, Suite 700, 1860 Lincoln Street, Denver, Colorado 80295.

*Career and Occupational Development Technical Report: Exercise Volume.* Career and Occupational Development Report No. 05-COD-20.

For exercises that have been released, this volume provides a copy of the exercise, complete documentation about administration and scoring procedures and national results for each foil and/or scoring category.

*The First National Assessment of Career and Occupational Development: An Overview.* Career and Occupational Development Report No. 05-COD-00.

*Adult Work Skills and Knowledge: Selected Results from the First National Assessment of Career and Occupational Development.* Career and Occupational Development Report No. 05-COD-01.

*An Assessment of Career Development Basic Work Skills: Selected Results from the First National Assessment of Career and Occupational Development.* Career and Occupational Development Report No. 05-COD-02.

*Objectives for Career and Occupational Development (1971).* National Assessment of Educational Progress.

This volume contains all of the COD objectives which were samples for the 1973 assessment which is described in this publication series.

*Revised Objectives for Career and Occupational Development (1977).*

This volume contains the COD objectives which will be sampled for the second COD assessment which is targeted for 1978.

# Eleven-Year Career Stability and Change as Reflected in Project TALENT Data Through the Flanagan, Holland, and Roe Occupational Classification Systems

DONALD H. McLAUGHLIN
American Institutes for Research
Palo Alto, California
DAVID V. TIEDEMAN
Northern Illinois University

The vocational psychologist seeks classifications of occupations which maximize career stability as occupations change from time to time in the life. This study investigates the extent of career stability and the patterns of career change which have occurred in the lives of Project TALENT twelfth grade students in the 11 yr elapsing since they were tested. "Career" plans in the last year of high school and at 1, 5, and 11 yr after testing were classified by the Flanagan, Holland, and Roe occupational classification systems in order to study the career stability and patterning within each system and to contrast both among systems. Career stability proved to be about the same in all three classification systems but decreased in all cases as the interval over which it was measured increased. Career stability increased as subjects grew older, proving to be the greatest from 5 to 11 yr after high school. Patterns of change mildly conformed to the circular patterns claimed by Holland and Roe for their systems and the linear pattern hypothesized for the Flanagan system. Generally, the direction of "career" flow was away from intellectual careers to careers in business and sales but each system had unique results as well.

A person's career consists of not merely a particular job but rather of a set of occupational activities in which he engages and through which he seeks progressively to reach his life goals. In pursuit of his career a person is likely to change jobs at least once and possibly several times. Sometimes, however, a job change is also a career change. Any attempt to study career stability, therefore, depends on the way in which one classifies occupations. In order to make meaningful general statements about careers, the vocational psychologist seeks a classification of occupations which maximizes career stability, the extent to which people remain in the same career even when changing jobs. Only when using an occupational classification exhibiting a high level of career stability will the researcher and the counselor be able to make long-term generalizations.

Of course, if all jobs are grouped into a single "career," career stability is perfect, artifactually. A classification must convey some information

---

Reprinted from *Journal of Vocational Behavior*, 1974, *5*, 177-196 by permission of Academic Press, Inc. Research supported by National Institutes of Education Grant number OEG-0-71-3459.

DONALD H. McLAUGHLIN is with the American Institutes for Research, Palo Alto, California. DAVID V. TIEDEMAN is Professor and University Coordinator for the Office for Vocational, Technical, and Career Education, Northern Illinois University, DeKalb, Illinois.

in order to be useful, and the extent to which it conveys information is also the extent to which the expectation by chance of career stability departs from perfection. The more categories a classification has, the more likely it is that a change of jobs will be called a change of careers. Alternative proposals for career definition should be evaluated on the extent to which they convey *stable* information about careers.

In this paper, three classifications of occupations are applied to the data for Project TALENT subjects. Occupational choices and other information were recorded for these people in twelfth grade (1960) as well as 1, 5, and 11 yr after high school graduation (1961, 1965, 1971). The conclusions concern the relative stability of careers over the various time intervals for the three occupational classification systems and the structure in the distribution of career changes that occur.

## THREE OCCUPATIONAL CLASSIFICATION SYSTEMS

Holland (1970) and Roe (1956) both have systems of occupational classification which are in wide use. Flanagan (1971) has also devised a system of career groups which has already been used in Project PLAN and is the central organizing theme of *Career Data Book: Results from Project TALENT's Five-Year Follow-Up Study* (Flanagan, Tiedeman, Willis, & McLaughlin, 1973).

Flanagan's occupational classification system consists of 12 career groups numbered and labeled as follows:

| *Number* | *Group* |
|---|---|
| 1 | Engineering, physical science, mathematics, and architecture |
| 2 | Medical and biological sciences |
| 3 | Business administration |
| 4 | General teaching and social services |
| 5 | Humanities, law, social and behavioral sciences |
| 6 | Fine arts, performing arts |
| 7 | Technical jobs |
| 8 | Proprietors, sales |
| 9 | Mechanics, industrial trades |
| 10 | Construction trades |
| 11 | Secretarial-clerical, office workers |
| 12 | General labor, community and public service |

The occupations which Flanagan assigns to each of the 12 career groups were initially defined in Flanagan, Shaycoft, Richards, and Claudy (1971). They were based on the similarity of high school profiles of abilities and interests of people in different occupations 5 yr after high school. Flanagan subsequently slightly modified the location of a few occupations for the *Career Data Book*. The resulting system was used in this study.

Holland includes only six occupational groups in his classification system. The system was initially defined by Holland (1959) on the basis of a model of types of job environment and matching personality types. The classification used in this study was as follows:

| *Number* | *Group* |
|---|---|
| 1 | Realistic |
| 2 | Investigative (formerly intellectual) |
| 3 | Artistic (formerly number 6) |
| 4 | Social (formerly number 3) |
| 5 | Enterprising |
| 6 | Conventional (formerly number 4) |

Roe (1956) grouped occupations into eight categories in her classification system. The numbers and names of the Roe groups[1] are as follows:

---

[1] Upon recommendation of Dr. Holland, Dr. Gerald D. Williams served as referee of our assignment of TALENT occupations to Holland groups. Dr. Roe kindly refereed our assignment of TALENT occupations to her groups.

| *Number* | *Group* |
|---|---|
| 1 | Service |
| 2 | Business contact |
| 3 | Organization |
| 4 | Technology |
| 5 | Outdoor |
| 6 | Science |
| 7 | General cultural |
| 8 | Arts and entertainment |

There is a good deal of communality among the occupational groups of the Flanagan, Holland, and Roe occupational classification systems. The extent of the communality is shown in detail in Table 1 where Flanagan, Holland, and Roe classifications of the number of people planning for careers in 34 different occupations are arrayed. The data in Table 1 are based on responses to a 34-way classification of high school career plans on a question in Project TALENT's 1960 Student Information Blank. That question and its limitations for comparison of occupational classification systems are explained in detail below. Here we merely note that the data do not portray the full range of variability in occupational classification resulting from use of the three systems. Even so, the data of Table 1 do indicate that the three systems are not identical. The Flanagan system tends to stress level and kind of education in its categories more than the Holland and Roe systems; the Holland system tends to stress psychological function satisfied by the occupation more than the other two systems; and the Roe system tends to stress the kind of work done more than the other two systems.

## Project TALENT

During 1959-1960, an approximate 5% stratified random sample of public, parochial, and private high schools was selected for inclusion in Project TALENT. Approximately 400,000 students in grades 9-12 were included in the Project by this procedure, and each of the students sat for a 2-day battery of tests and inventories during Spring, 1960. The TALENT test battery consisted of numerous information, achievement, and aptitude tests and also of three questionnaires or inventories. The design of the project is described in detail in Flanagan *et al.* (1962).

The only item from this extensive 1960 testing which is used in this study is an item from the Student Information Blank which required the student to indicate his plan for a career upon completion of his education. The item was given to the student in the following form:

> In the following list of occupations, mark the one occupation you expect to make your career after you have completed your education. If your choice is not on the list, mark the one that is closest to it. Mark one of these even if you have not definitely made up your mind.
>
> A. Accountant
> B. Biological scientist (biologist, botanist, physiologist, zoologist, etc.)
> C. College professor
> D. Dentist
> E. Engineer (aeronautical, civil, chemical, mechanical, etc.)
> F. Elementary school teacher
> G. High school teacher
> H. Lawyer
> I. Mathematician
> J. Pharmacist
> K. Clergyman (minister, priest, rabbi, etc.)
> L. Physical scientist (chemist, geologist, physicist, astronomer, etc.)
> M. Physician
> N. Political scientist or economist
> O. Social worker
> P. Sociologist or psychologist
> Q. Armed forces officer
> R. Artist or entertainer
> S. Businessman
> T. Craftsman
> U. Engineering or scientific aide
> V. Forester

## TABLE 1

Frequency of Expressed Career Plans, of Twelfth Grade Males in the 1960 Project TALENT Sample, in each Combination of Categories of the Flanagan, Holland, and Roe Classification Systems[a]

| | | Holland Classification | | | | | | | Roe Classification | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | Total | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Flanagan Classification | 1 | | 3161 | | | | | 3161 | | | | 2446 | | 715 | | |
| | 2 | 275 | 952 | | 24 | | | 1251 | | | | | 275 | 976 | | |
| | 3 | | 624 | | | 882 | 582 | 2088 | 444 | 882 | 582 | 180 | | | | |
| | 4 | | | | 1135 | | | 1135 | 56 | | | | | | 1079 | |
| | 5 | | 158 | 73 | 88 | 401 | | 720 | 99 | | | | | | 621 | |
| | 6 | | | 188 | | | | 188 | | | | | | | | 188 |
| | 7 | | 138 | | 47 | | | 185 | | | | 138 | | 47 | | |
| | 8 | | | | | 139 | | 139 | | 139 | | | | | | |
| | 9 | 959 | | | | | | 959 | | | | 959 | | | | |
| | 10 | 141 | | | | | | 141 | | | 141 | | | | | |
| | 11 | | | | | | 46 | 46 | | | 46 | | | | | |
| | 12 | 570 | 245 | | 69 | | | 884 | 447 | | | | 437 | | | |
| | Total | 1945 | 5278 | 261 | 1363 | 1422 | 628 | 10897 | 1046 | 1021 | 769 | 3713 | 712 | 1738 | 1700 | 188 |
| Holland Classification | 1 | | | | | | | | 133 | | 141 | 959 | 712 | | | |
| | 2 | | | | | | | | 788 | | | 2764 | | 1667 | 59 | |
| | 3 | | | | | | | | | | | | | | 73 | 188 |
| | 4 | | | | | | | | 125 | | | | | 71 | 1167 | |
| | 5 | | | | | | | | | 1021 | | | | | 401 | |
| | 6 | | | | | | | | | | 628 | | | | | |

[a] Note: Only subjects who responded to the 1971 follow-up are included in this study.

W. Medical or dental technician
X. Nurse
Y. Pilot, airplane
Z. Policeman or fireman
AA. Secretary, office clerk or typist
BB. Writer
CC. Barber or beautician
DD. Enlisted man in the armed forces
EE. Farmer
FF. Housewife
GG. Salesman or saleswoman
HH. Skilled worker (electrician, machinist, plumber, printer, etc.)
II. Structural worker (bricklayer, carpenter, painter, paperhanger, etc.)
JJ. Some other occupation different from any above.

These 34 occupations (excluding responses "FF" and "JJ"), which we call "1960 occupations," were each classified under the Flanagan, Holland, and Roe occupational systems, and the results of this classification

**TABLE 2**
Placement of "1960 Occupations" into the Occupational Groups of Three Classification Systems

| | Flanagan Category | Holland Category | Roe Category |
|---|---|---|---|
| Engineer | 1 | 2 | 4 |
| Mathematician | 1 | 2 | 6 |
| Physical scientist | 1 | 2 | 6 |
| Biological scientist | 2 | 2 | 6 |
| Dentist | 2 | 2 | 6 |
| Pharmacist | 2 | 2 | 6 |
| Physician | 2 | 2 | 6 |
| Nurse | 2 | 4 | 6 |
| Forester | 2 | 1 | 5 |
| Armed Forces Officer | 3 | 2 | 1 |
| Airplane pilot | 3 | 2 | 4 |
| Businessman | 3 | 5 | 2 |
| Accountant | 3 | 6 | 3 |
| Social worker | 4 | 4 | 1 |
| Elementary school teacher | 4 | 4 | 7 |
| High school teacher | 4 | 4 | 7 |
| Clergyman | 4 | 4 | 7 |
| College professor | 5 | 4 | 7 |
| Lawyer | 5 | 5 | 7 |
| Writer | 5 | 3 | 7 |
| Political scientist or economist | 5 | 2 | 7 |
| Sociologist or psychologist | 5 | 2 | 1 |
| Artist or entertainer | 6 | 3 | 8 |
| Engineering or scientific aide | 7 | 2 | 4 |
| Medical or dental technician | 7 | 4 | 6 |
| Salesperson | 8 | 5 | 2 |
| Craftsman | 9 | 1 | 4 |
| Skilled worker | 9 | 1 | 4 |
| Structural worker | 10 | 1 | 4 |
| Secretary, office clerk, or typist | 11 | 6 | 3 |
| Farmer | 12 | 1 | 5 |
| Policeman or fireman | 12 | 1 | 1 |
| Enlisted man in the Armed Forces | 12 | 2 | 1 |
| Barber or beautician | 12 | 4 | 1 |

are reported in Table 2. The table indicates that there is at least one of the 1960 occupations in each group of each of the three classification systems. However, the table also reveals that the distribution is not uniform. This is not surprising in view of the fact that the item was not designed with any one of the classification systems in mind. However, because only 34 categories of occupations appear, the analyses of this study which relate to the 1960 occupational plan data must be viewed with caution. The data for 1961, 1965, and 1971 were based on free responses and were subjected to a much finer and more extensive occupational classification (over 200 categories).

Project TALENT's students have been followed up 1, 5, and 11 yr after their expected years of graduation. The 11-yr follow-up is still in progress; however, data from the 1960 twelfth grade 11-yr follow-up have just recently become available. This study was therefore limited to the twelfth grade data from Project TALENT. The present results can be subject to verification as the results of the three remaining eleven year surveys become available.

The data included in this study are limited to males. Occupational variability is greater in TALENT's males than in its females due to the stability of the housewife career among its subjects (Flanagan, Shaycoft, Richards, & Claudy, 1971). Nevertheless, there is still considerable career activity among the females participating in TALENT, and females will be incorporated into future TALENT research into the issues investigated in the present study.

TALENT students are asked what their occupation is or will be each time they are surveyed. The occupation named is coded into four and three digit codes. Those codes formed the bases of the coding for the Flanagan, Holland, and Roe classification systems which is reported in this study.

## The Problem

As indicated, we have data on TALENT males which indicate the occupation they intended to pursue when they reported in 1960. We then have reports on the occupations they were pursuing in 1961, 1965, and 1971. From previous analyses, we know that "overall for males, at the time of the five-year follow-up, only . . . 18.6% of the 12th graders still planned the career they had chosen in high school. . . ." (Flanagan, Shaycoft, Richards, & Claudy, 1971, pp. 3-10.) These results are in terms of a few more than the 34 career areas listed above for item 211 in the 1960 Student Information Blank. This stability value probably drops as the time between initial and current occupational plans increases. Hence, it seems reasonable to assume that occupational stability is small over the period from stated plan while in high school to 11 yr after year of expected high school graduation. The question then arises as to whether there are categories of occupations for which the stability is greater. We shall refer to the stability of membership in a category of one of the three classification systems as "career stability." Thus, from the point of the Flanagan system, "careers" correspond to levels and kinds of education; from the point of view of the Holland system, they correspond to psychological functions; and from Roe's point of view, they correspond to the kind of work done.

Furthermore, neither the extent to which the different career definitions change in stability nor the extent to which career changes match patterns predicted by the three models are known over the 11-yr post-high-school period. In the present analysis of the Project TALENT data, the intent is to evaluate the relative stability of the different classification systems over different time intervals and to observe the extent to which frequencies of career change conform to the models underlying the systems.

## METHOD

A good deal of the method used to compare career stability was outlined in the previous section. As noted, the occupational plan recorded in a male's senior year in high school (1960 data) is compared with his occupational plan 1 yr (1961 data), 5 yr (1965 data) and 11 yr (1971 data) after initial testing. Stated occupational plans are used in this study, rather than actual occupations, because 1 and 5 yr after high school, subjects preparing for many professional careers will not have entered into actual jobs in their career field. However, plans are "purified" to remove people with plans who have not begun preparing to carry them out by 5 yr after high school.

Occupational category membership is obtained relative to the Flanagan, the Holland, and the Roe occupational classification systems for all twelfth grade male subjects for whom Project TALENT has 11-yr follow-up data. For each of the six time intervals (1960-1961, 1960-1965, 1960-1971, 1961-1965, 1961-1971, and 1965-1971) the stability of the occupational classifications is measured.

Each earlier occupational plan is cross tabulated against all later occupational plans for the same subject. The percent of students who do not vary in occupational class ("career") from an earlier to a later observation is then computed for each classificatory system in each combination. Since the Flanagan, Holland, and Roe systems of occupational classification have 12, 6, and 8 groups, respectively, unless allowance is made for the different categories, we would expect the system with the fewest categories, namely the Holland system, to reflect the highest stability. The expectation of apparent stability in a $k$-category system with a random, uniform distribution (i.e., no real stability) is $1/k$. For example, stability is perfect, namely 100%, when the number of classes in a classificatory system is one. Since with fewer categories, more artifactual stability is to be expected, some standardization for number of categories is necessary.

An important property of an index of stability to compare classification systems with varying numbers of categories is that it be "category-invariant." Although "category-invariance" can be defined in various ways, an accepted definition is in terms of invariance-over-combining-categories (see Luce, Bush, & Galanter, 1963, for an application to learning models). This means that if a second classification system is derived from a given classification system merely by combining some categories of the original classification, the index of stability of the data should be the *same* for both systems if there were no predictability *within* the combined categories.

Two measures which satisfy this category-invariance criterion are (1) the amount of contingent information in the bivariate distribution and (2) any function of the chi-square contingency measure. These measures have a drawback in common: as usually defined they measure dependence in off-diagonal as well as diagonal cells. Therefore we shall specifically define the stability measures reported here not to include off-diagonal predictability. In so doing, it turns out that the combining-categories condition is slightly violated; therefore, stability measures have been computed both including and excluding off-diagonal dependence to permit comparison.

One of the "almost-category-invariant" measures of the "stability" of a bivariate distribution is derived from the amount of contingent information conveyed (Garner, 1962). For a bivariate distribution the amount of contingent information (or uncertainty) is a nominal scale analogue of covariance. It is calculated as the difference between the actual uncertainty of the bivariate distribution and the uncertainty of an *independent* bivariate distribution with the same marginals.

The measure of contingent information between earlier and later careers is the *amount of reduction of uncertainty about a person's later expressed career, achieved when a person's earlier expressed career is made known.* It is measured in bits, which are equivalent to number of "yes-no" questions (with equiprobable answers) needed to determine the career, and it is category-invariant.

However, because we wished to include only the dependence due to deviation of the *main diagonal* probabilities from their expected values, we also replaced the off-diagonal relative frequencies by the values they would assume if the only dependence were on the diagonal. The measure of diagonal-contingent uncertainty then indicated the uncertainty reduction about a person's later career that is the result of knowing his earlier career, ignoring all off-diagonal dependencies.

The second "almost-category-invariant" statistic we use is $C = (\chi^2/N) + 1$, in which the $\chi^2$ compares the observed frequencies to those expected when frequencies in diagonal cells are constrained to be equal to the products of the marginals (i.e., to contain no dependence), but other cell frequencies are allowed to take on maximum likelihood estimates.

The statistic $C$ also has a meaningful interpretation: it is the *number of perfectly discriminating categories* to which the value of $\chi^2$ is equivalent. For example, if for a 12-category system with an $N = 5000$ the value of $\chi^2$ is 10000, then the system is equivalent to a perfectly discriminating three category system. The reason we can make this statement is that the maximum value of $\chi^2$ for a $(K \times K)$ bivariate category system for partitioning $N$ observations is $N(K - 1)$, assuming each marginal category has at least one observation. This maximum value, it must be noted, can be obtained only when the marginals of the first dimension (earlier classification) are the same as the marginals of the second dimension (later classification). The distribution of this $\chi^2$-statistic assuming no dependence in a bivariate $K \times K$ category system is independent of $N$ and is distributed approximately as $\chi^2$ with $K$ degrees of freedom. Therefore, the value of $C$ expected by chance, $E(C)$, for a $K$-category system is approximately $K/N + 1$. In the present study, $E(C)$ is always between 1.00 and 1.01. The use of $C$, which is a comparison with perfect stability, is more fruitful than using $\chi^2$, which is a comparison with chance stability, because in all cases in this study the statistical significance of the $\chi^2$ is great enough to make comparisons of levels of significance meaningless.

## Patterns of Career Changes

We have considered the extent to which careers are stable. However, in each of the three classificatory systems there are some categories that are considered closer to each other. We can, therefore, test the validity of the systems by the extent to which career changes, when they occur, conform to the predicted rules.

Flanagan makes no assumption about the order of his groups; however, from examination of his classification system we conjecture that because his groups with smaller numbers ordinarily require more formal education than groups 7-12, there will be more changes of smaller distances than expected by chance. Holland, Viernstein, Hao-Mei Kus, Karweit, and Blum (1970) on the other hand have observed that the correlations of scores on the Holland interest test in categories corresponding to his occupational classification system are higher when the occupations in his system are only one group apart than when they are two groups apart, and higher for two than for three groups apart. Since Holland has found these relationships to reverse when groups are four and five groups apart, he claims evidence (Holland *et al.*, 1970) for the circular nature of his classification system. In short, his group 1 is only one group away from his group 6 as the linear chain of groups is looped back onto itself to connect its two open ends. Roe makes a similar claim for her classification system (Roe, Hubbard, Hutchinson, & Bateman, 1966).

In order to test the underlying models, the distances between categories were arranged in increasing order based on each model, and the ratio of the observed frequencies of category shifts of each "distance" to the frequencies predicted from the marginal distributions assuming a random distribution of category shifts was computed. The extent to which the resulting function decreases monotonically is a crude measure of the fit of the underlying models to the data.

In order to gain a better understanding of the flow of career change, the categories in each system were reordered to maximize the directionality of the changes. The directionality in the resulting distributions, and how it changed across the time intervals involved, were analyzed and the results are presented.

## RESULTS

### Basic Data

Bivariate frequency distributions for earlier vs later occupational classifications were computed for each of the six combinations of the four data sets for each classification system. All subsequent analyses reported here are based on these data. The difference in total *n*'s for the frequency distributions is a function of both the follow-up sample attrition and the frequency of nonclassifiable responses. All subjects in this study have 1971 data.

The observed and expected proportions of cases which were in the same career are given in Table 3. All observed proportions are significantly greater than the expected proportions (based on the marginal distributions) at beyond the .0001 level of significance. The observed proportions (1) are similar for the

**TABLE 3**

Percents in Same Categories in Each Comparison for each Classification System

|  |  | Year |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
|  |  | 1961 |  | 1965 |  | 1971 |  |
| Year | Classification | Observed | Expected | Observed | Expected | Observed | Expected |
| 1960 | F | 54.5 | 14.9 | 35.4 | 12.5 | 28.6 | 11.5 |
|  | H | 57.8 | 25.8 | 44.7 | 22.0 | 38.6 | 19.8 |
|  | R | 44.1 | 14.6 | 34.2 | 14.7 | 28.6 | 13.9 |
| 1961 | F | — | — | 47.6 | 12.3 | 38.0 | 11.5 |
|  | H | — | — | 55.9 | 21.0 | 46.4 | 19.6 |
|  | R | — | — | 53.4 | 14.7 | 42.9 | 14.6 |
| 1965 | F | — | — | — | — | 57.0 | 11.9 |
|  | H | — | — | — | — | 63.3 | 21.6 |
|  | R | — | — | — | — | 61.1 | 16.9 |

Note: The expected values are based on the assumption of no tendency to remain in the same career. F, H, and R refer to the Flanagan, Holland, and Roe classification systems.

## TABLE 4a
Contingent Information Measures of Career Stability

| | | | Later career | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1961 | | 1965 | | 1971 | |
| | | | Diagonal | Complete | Diagonal | Complete | Diagonal | Complete |
| Earlier career | 1960 | F | .646 | .838 | .275 | .421 | .176 | .293 |
| | | H | .413 | .461 | .204 | .256 | .144 | .192 |
| | | R | .400 | .689 | .201 | .384 | .137 | .232 |
| | 1961 | F | — | — | .588 | .782 | .376 | .582 |
| | | H | — | — | .448 | .497 | .279 | .333 |
| | | R | — | — | .619 | .703 | .376 | .463 |
| | 1965 | F | — | — | — | — | .928 | 1.140 |
| | | H | — | — | — | — | .642 | .701 |
| | | R | — | — | — | — | .819 | .914 |

Note: F, H, and R refer to measures using the Flanagan, Holland, and Roe classification schemes, respectively.

## TABLE 4b
Chi-Square, Number of Discriminable Categories, Measures of Career Stability

| | | | Later career | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1961 | | 1965 | | 1971 | |
| | | | *C* | (*C*-1)/(*K*-1) | *C* | (*C*-1)/(*K*-1) | *C* | (*C*-1)/(*K*-1) |
| Earlier career | 1960 | F | 2.64 | .15 | 1.71 | .07 | 1.44 | .04 |
| | | H | 1.92 | .18 | 1.42 | .08 | 1.30 | .06 |
| | | R | 2.18 | .17 | 1.56 | .08 | 1.38 | .05 |
| | 1961 | F | — | — | 2.64 | .15 | 2.03 | .09 |
| | | H | — | — | 1.92 | .18 | 1.59 | .12 |
| | | R | — | — | 2.50 | .21 | 1.94 | .13 |
| | 1965 | F | — | — | — | — | 3.86 | .26 |
| | | H | — | — | — | — | 2.42 | .28 |
| | | R | — | — | — | — | 3.19 | .31 |

Note: F, H, and R refer to measures using the Flanagan, Holland, and Roe classification schemes, respectively.

three classification systems, (2) are clearly greater for shorter time intervals than for longer time intervals, and (3) are clearly greater for later time intervals than for earlier time intervals. These generalizations are in accord with common sense.

The measures of stability calculated from information theory and likelihood theory are given in Tables 4a and 4b. The similarity of the contingent information measures, with and without off-diagonal dependence included, suggests that the primary form of the dependence between earlier and later careers is that people tend to stay in the same career.

Evidently, the classification schemes with larger numbers of categories do contain somewhat more contingent information. However, the predictability is not extremely high for any of the systems. In no case does a classification perform as well as a hypothetical one consisting of four perfectly discriminating categories. However, it should also be pointed out that none of the systems were designed with the intent of achieving a maximal level of stability.

A measure of the "efficiency" of the categories can be computed as the ratio of the number of perfectly discriminating categories achieved to the number of categories used in the classification, although it is far from being category-invariant. Because the efficiency of a classification scheme that is equivalent to a single category should be *zero* and of one that is perfect should be *one*, the value *one* is subtracted from the numerator and denominator of the efficiency ratio. The efficiency of Flanagan categories is slightly less than that of the other systems. This is to be expected, if we suppose that, in any system, the most discriminating categories are chosen first for inclusion and later categories account for relatively less of the variance.

All three classification systems show essentially the same relative levels of career stability across different time intervals. Therefore, there is no evidence in the present study to suggest that people are more stable according to one type of categorization at early stages and more stable according to a different categorization at later stages.

**TABLE 5**

Proportion of Observations Switching Between Flanagan Classifications

| Later category number minus earlier category number | % 60-61 | % 60-65 | % 60-71 | % 61-65 | % 61-71 | % 65-71 |
|---|---|---|---|---|---|---|
| 11 | .23 | .26 | .20 | .14 | .08 | .06 |
| 10 | .36 | .27 | .13 | .22 | .09 | .13 |
| 9 | .62 | .85 | 1.20 | .72 | 1.06 | .06 |
| 8 | .89 | .73 | .67 | .60 | .66 | .93 |
| 7 | .20 | .32 | .32 | .30 | .44 | .63 |
| 6 | 1.35 | 1.23 | 1.57 | 1.37 | 1.65 | 1.71 |
| 5 | 2.17 | 1.27 | 1.13 | 1.31 | 1.61 | 1.46 |
| 4 | 1.87 | 2.08 | 2.94 | 2.38 | 3.93 | 3.59 |
| 3 | 2.22 | 2.23 | 2.29 | 2.12 | 2.19 | 1.81 |
| 2 | 4.27 | 4.15 | 3.96 | 4.75 | 4.59 | 3.99 |
| 1 | 3.96 | 4.82 | 5.46 | 4.61 | 5.35 | 4.95 |
| 0 | 54.47 | 35.40 | 28.56 | 47.64 | 38.03 | 56.96 |
| −1 | 5.89 | 8.26 | 7.96 | 7.53 | 7.84 | 4.30 |
| −2 | 3.29 | 10.29 | 10.75 | 8.09 | 9.52 | 5.18 |
| −3 | 3.14 | 4.92 | 5.50 | 3.99 | 4.95 | 2.84 |
| −4 | 3.45 | 4.83 | 4.77 | 3.68 | 3.67 | 2.55 |
| −5 | 2.22 | 3.76 | 4.82 | 3.34 | 4.54 | 4.06 |
| −6 | 3.48 | 5.26 | 5.05 | 3.02 | 3.18 | 1.59 |
| −7 | 1.08 | 2.65 | 4.83 | 1.41 | 2.92 | 1.44 |
| −8 | 2.07 | 2.79 | 3.06 | 1.13 | 1.42 | .54 |
| −9 | 1.38 | 1.83 | 2.49 | .95 | 1.37 | .85 |
| −10 | .62 | .88 | .96 | .38 | .31 | .13 |
| −11 | .74 | .94 | 1.36 | .32 | .59 | .24 |
| *N* | 6082 | 6601 | 9300 | 5033 | 6406 | 6794 |

## TABLE 6
Proportion of Observations Switching Between Holland Classifications

| Later category number minus earlier category number | % 60-61 | % 60-65 | % 60-71 | % 61-65 | % 61-71 | % 61-71 |
|---|---|---|---|---|---|---|
| 5 | .74 | 1.04 | 1.20 | 1.00 | 1.07 | .53 |
| 4 | 2.89 | 2.26 | 2.56 | 2.16 | 2.44 | 3.11 |
| 3 | 3.09 | 3.16 | 2.96 | 2.18 | 2.48 | 2.16 |
| 2 | 3.60 | 3.46 | 2.99 | 3.85 | 3.13 | 2.10 |
| 1 | 12.84 | 15.91 | 15.10 | 8.72 | 10.33 | 6.65 |
| 0 | 57.79 | 44.72 | 38.65 | 55.88 | 46.40 | 63.32 |
| −1 | 6.63 | 7.50 | 7.45 | 8.11 | 8.11 | 6.56 |
| −2 | 4.72 | 5.81 | 5.80 | 5.02 | 5.87 | 3.65 |
| −3 | 4.42 | 10.60 | 16.61 | 7.04 | 11.20 | 5.87 |
| −4 | 2.83 | 4.77 | 6.16 | 5.03 | 8.08 | 5.58 |
| −5 | .43 | .76 | .51 | 1.01 | .88 | .46 |
| *N* | 6496 | 6812 | 9588 | 5324 | 6894 | 7364 |

## TABLE 7
Proportions of Observations Switching Between Roe Classifications

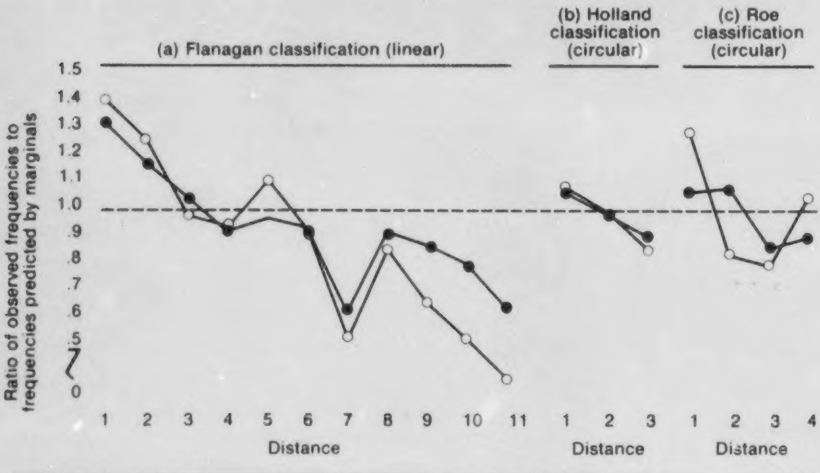
| Later category number minus earlier category number | % 60-61 | % 60-65 | % 60-71 | % 61-65 | % 61-71 | % 61-71 |
|---|---|---|---|---|---|---|
| 7 | .05 | .13 | .14 | .25 | .30 | .15 |
| 6 | .81 | 1.23 | 1.47 | 1.61 | 1.94 | 1.05 |
| 5 | 1.12 | 2.36 | 2.76 | 2.38 | 3.55 | 1.83 |
| 4 | 3.53 | 5.33 | 6.83 | 5.19 | 7.87 | 4.59 |
| 3 | 4.02 | 6.46 | 8.44 | 4.23 | 5.55 | 2.52 |
| 2 | 15.27 | 10.55 | 9.72 | 4.09 | 4.54 | 3.18 |
| 1 | 6.09 | 12.23 | 15.71 | 7.07 | 9.47 | 8.96 |
| 0 | 44.13 | 34.20 | 28.60 | 53.38 | 42.89 | 61.14 |
| −1 | 9.45 | 10.66 | 10.24 | 9.01 | 10.93 | 8.10 |
| −2 | 5.28 | 5.80 | 6.34 | 4.09 | 5.02 | 3.67 |
| −3 | 4.37 | 5.60 | 5.22 | 2.36 | 2.25 | 1.34 |
| −4 | 3.24 | 2.63 | 2.22 | 3.09 | 2.58 | 1.59 |
| −5 | 1.42 | 1.56 | 1.27 | 1.82 | 1.61 | .85 |
| −6 | .96 | 1.08 | .80 | 1.27 | 1.81 | .77 |
| −7 | .25 | .18 | .26 | .13 | .31 | .25 |
| *N* | 6320 | 6737 | 9550 | 5204 | 6698 | 7254 |

### Patterns of Career Changes

Summary data on the "distances" of later category numbers from earlier occupational category numbers are reported in Tables 5, 6, and 7 for the Flanagan, Holland, and Roe systems, respectively. Tables 5, 6, and 7 indicate the percent of all cases in a given combination in which a later category differed from an earlier category by the amount indicated in the first column of the table. For instance, Table 5 reports that 3.9% of the 6082 twelfth grade students had a later (1961) occupational category number one greater than an earlier (1960) occupational category number.

In order to determine the extent to which these frequencies support conjectured structures of the three classification schemes (linear for the Flanagan categories and circular for

**FIGURE 1**
Frequencies of Career Changes as a Function of the Distance between Category Numbers, Relative to Values Expected if No Distance Effect Were Present



● 60→61, 60→65, and 60→71 data combined
○ 61→65, 61→71, and 65→71 data combined

the Holland and Roe categories), the frequencies of transitions as a function of distance were divided by the predicted frequencies if transitions were random, and the results were plotted in Fig. 1. For each system, the distances were combined across directions (increasing and decreasing category numbers). For the Holland and Roe systems, in addition, the last category was considered adjacent to the first category, so that, for example, in the Holland system, categories 1 and 5 were considered separated by a distance of 2(1 → 6 → 5), not 4.

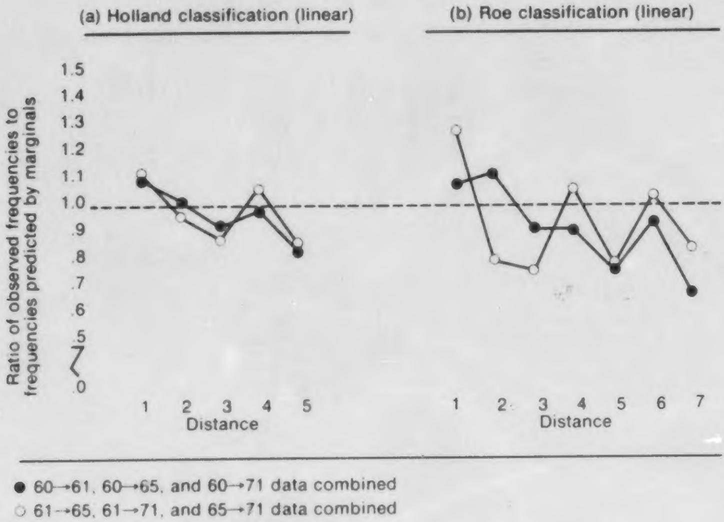
The frequencies used as the predicted values based on a hypothesis of no effect, and therefore as the denominators of the ratios in Fig. 1, were proportional to the products of the marginals of the distributions of those who changed categories. The data are presented in Fig. 1 separately for transitions from high school plans (solid circles) and transitions after high school (empty circles).

There appears to be some support for each of the structures, in the present data. In each case, transitions of greater "distance" are relatively somewhat less frequent than transitions of less "distance." Because of the large *n*, the effects are all highly significant. However, they do not appear to account for a great deal of the variance in the frequencies of career change, for the Holland and Roe systems especially. Because the frequencies in the Holland and Roe systems may be linearly ordered, the corresponding ratios of observed to expected frequencies assuming a linear organization of the categories in these systems were calculated and are presented in Fig. 2.

There are several reliable "bumps" on the curves that are deviations from the conjectured structures; for example, the relative dearth of changes

**FIGURE 2**

Frequencies of Career Changes as a Function of the Distance between Category Numbers, Relative to Values Expected if No Distance Effects Were Present



of "distance 7" in the Flanagan system. However, there is no single pair of categories or simple explanation that reasonably accounts for any of these deviations.

A feature of career changes is the extent to which they are *directional*. While some categories appear very frequently in earlier plans, different categories appear more frequently on later follow-ups. Because of its conjectured linear structure we might expect the Flanagan categories to show such a tendency, whereas the circular Holland and Roe structures would not be expected to have a "top" and "bottom" of the line. In order to shed further light on the nature of category changes, the categories in each system were rearranged to maximize the directionality of the flow of people between categories. The results are shown in Table 8, separately for changes from high school plans and for changes after high school.

The directionality is equally great in all three systems, perhaps belying the applicability of the circular model of the Holland and Roe systems for accounting for career changes. The directionality is significantly greater for changes with respect to high school plans, although the difference is not large.

In terms of the Flanagan categories, changes tend to be away from careers requiring a college degree. Category 3 (Business Administration) shows changes away from high school plans, but later it becomes the target of many changes. Category 7 (Technical Positions) shows a great increase over the number that would have been predicted in high school but not a great increase later, suggesting that people make the change into (planning for) a technical career soon after high school, if ever.

In terms of the Holland system, changes tend to be away from Inves-

### TABLE 8

### Direction of Maximal Flow between Careers, in Terms of Three Classification Systems

| | Transitions from high school plans (1960→1961, 1965, 1971) | Transitions after high school (1961→1965, 1971; 1965→1971) |
|---|---|---|
| Flanagan System | Engineering, Phys. Sci., etc.<br>Medical Science<br>Teaching & Social Services<br>Business Administration<br>Art<br>Humanities, Law, etc.<br>Industrial Trades<br>General Labor, etc.<br>Construction Trades<br>Office Workers<br>Technical Jobs<br>Sales<br>75%[a] | Medical Science<br>Engineering, Phys. Sci., etc.<br>Art<br>Teaching & Social Services<br>Humanities, Law, etc.<br>Technical Jobs<br>Office Workers<br>Industrial Trades<br>Business Administration<br>General Labor, etc.<br>Construction Trades<br>Sales<br>70%[a] |
| Holland system | Investigative<br>Conventional<br>Social<br>Realistic<br>Enterprising<br>Artistic<br>76%[a] | Investigative<br>Artistic<br>Social<br>Conventional<br>Realistic<br>Enterprising<br>69%[a] |
| Roe system | Outdoor<br>Technology<br>Science<br>Cultural<br>Service<br>Business<br>Art<br>Organization<br>78%[a] | Science<br>Cultural<br>Outdoor<br>Business<br>Service<br>Technology<br>Art<br>Organization<br>67%[a] |

[a] Percentages are of all career changes, those that are in the directions of the arrows. Because the categories have been rearranged to maximize these percentages, their values expected by chance are slightly greater than 50% (but much less than 60%).

tigative (Category 2) and toward Realistic (Category 1) and Enterprising (Category 5) career environments. This result is essentially the same as the statement for the Flanagan system. The change in the position of "Artistic" careers in the two hierarchies indicates that there were a large number of high school students who did not check the alternative "Artist or Entertainer" or "Writer" in the 1960 TALENT item but who gave responses in the "Artistic" category of Holland's system in the follow-ups. Referral to the list of occupations classified in the "Artistic" category on follow-ups suggests an artifacutal reason for this: some occupations were ones which would have led to other answers in the 1960 item (such as college English teacher, architect, public relations, and linguist).

In terms of the Roe system, changes tend to be away from Outdoor (Category 5) and Science (Category 6) activities and toward Organization (Category 3) and Arts and Entertainment (Category 8). This is again the result of confrontation of individual ideals with economic reality reflected in the Flanagan and Holland systems. The change in the position of "Technology" in the two Roe hierarchies is not as clearly the result of an artifact as was the shift in Holland's "Artistic" category. A large number of high school students checked the alternative "Engineer" who later turned to "Business contact" and "Organization" careers; but between 1 and 11 yr after high school there were as many becoming "technologists" (including "skilled tradesmen," "repairmen," and "general Laborers") as were leaving this category. The mix of people in this category was changing, however.

## CONCLUSIONS

1. Career stability, measured in terms of classification systems developed by Flanagan, by Holland, and by Roe, was about the same for each system. The greater the number of categories, the more stability that was tapped, although less "efficiently."

2. Career stability decreased as the interval over which it was measured increased. In particular, there were a large number of people with the same career plans 5 yr after high school as they had in high school, or 1 yr after high school, but who changed in the next 5 yr.

3. Career stability increased as subjects grew older, with the greatest stability in the present study at the "latest" interval, from 5 yr after high school to 11 yr after high school. Evidence mentioned by Holland *et al.* (1970) on 30-39 year-olds, who had proportions-in-the-same-category of 70 and 62% for 5- and 10-yr periods, is consonant with the results of this study and the assumption that career stability continues to increase moderately after the first decade after high school.

4. Patterns of career change mildly supported conjecture structures of careers underlying the three classification systems. However, there was no more support for the circularity of the Holland and Roe structures than there was for the assumption that they were ordered along a line.

5. There was a clear directionality of the flow of people across career categories, for each of the three systems. Generally, the flow was away from intellectual careers to careers in business and sales. However, there were some results specific to each of the three systems.

## REFERENCES

Flanagan, J. C., Dailey, J. T., Shaycoft, Marion F., Gorham, W. A., Orr, D. B., & Goldberg, I. *The talents of American youth.* (Vol. 1.) *Design for a study of American youth.* Boston: Houghton Mifflin, 1962.

Flanagan, J. C., Shaycoft, Marion F., Richards, J. M., Jr., & Claudy, J. G. *Five years after high school.* (Final Report to the U.S. Office of Education.) Palto Alto: Project TALENT Office, American Institutes for Research and University of Pittsburgh, 1971.

Flanagan, J. C., Tiedeman, D. V., Willis, M. B., & McLaughlin, D. H. *The career data book: Results from Project TALENT's five-year follow-up study.* Palo Alto: Project TALENT Office, American Institutes for Research, 1973.

Garner, W. R. *Uncertainty and structure as psychological concepts.* New York: John Wiley and Sons, Inc. 1962.

Holland, J. L. A theory of vocational choice. *Journal of Counseling Psychology,* 1959, *6,* 35-45.

Holland, J. L., Viernstein, M. C., Hao-Mei Kus, Karweit, N. L., & Blum, Z. D. *A psychological classification of occupations.* Report No. 90, Center for the Study of Social Organization of Schools, Johns Hopkins University, 1970.

Luce, R. D., Bush, R. R., & Galanter, E. *Handbook of mathematical psychology.* (Vol II.) (Chapter by S. Sternberg, pp. 19-24) New York: John Wiley and Sons, Inc., 1963.

Roe, Anne. *The psychology of occupations.* New York: John Wiley and Sons, 1956.

Roe, A., Hubbard, W. D., Hutchinson, T., & Bateman, T. Studies of occupational history. Part I: Job changes and the classification of occupations. *Journal of Counseling Psychology,* 1966, *13,* 387-393.

Received: January 21, 1974.

# A Social Learning Theory of Career Selection

JOHN D. KRUMBOLTZ
Stanford University
with ANITA M. MITCHELL
and G. BRIAN JONES
American Institutes for
Research
Palo Alto, California

## PROBLEM

Why do people happen to enter the particular educational programs or occupations they do? How or why is it that they change from one educational program or occupation to another at various points throughout their lives? How can it be explained that they express different preferences for various programs or occupations at different times in their lives?

A number of attempts has been made to understand these phenomena. What follows is a social learning theory analysis of career decision making. This analysis provides a basis for a series of propositions that lead to some testable hypotheses and provide a framework for a synthesis of existing empirical evidence.[1]

The theory presented here attempts to explain how educational and occupational preferences and skills are acquired and how selections of courses, occupations, and fields of work are made. It identifies the interactions of genetic factors, environmental conditions, learning experiences, cognitive and emotional responses, and performance skills that produce movement along one career path or another. Combinations of these factors interact in different ways to produce different decisions.[2]

At each decision point the decider has one or more response or decision options. Internal (personal) and external (environmental) influencers (constraints or facilitators) shape the nature and number of those options and the way in which individuals respond to them. Sometimes so many options are available that the individual feels incapable of deciding.

---

[1] A description of the empirical evidence relevant to this theory has been prepared by Anita M. Mitchell and appears as Chapter 3 in Mitchell, Jones and Krumboltz (1975). In Chapter 5 G. Brian Jones has suggested relevant research and development priorities.

[2] Possible practical applications and a summary of the theory are discussed in Krumboltz, Mitchell and Gelatt (in press).

---

Reprinted with permission of *The Counseling Psychologist*, 1976, *6*, 71-80.
JOHN D. KRUMBOLTZ is with Stanford University, Stanford, California. ANITA M. MITCHELL and G. BRIAN JONES are with the American Institutes for Research, Palo Alto, California.
Portions of this paper were presented by John D. Krumboltz as his Presidential Address to the Division of Counseling Psychology at the APA Convention in Chicago, August 30, 1975.
Work leading to the development of this paper was performed at the American Institutes for Research in Palo Alto, California, with support from the National Institute of Education. Especially appreciated were the efforts of Ivan Charner (Project Monitor), H. B. Gelatt, Waldemar R. Unruh, Barbara A. Sanderson, David "Randy" Black, and Craig Ewart.

At other times options may be so limited or so disproportionate in value that the individual feels only one option is available. In fact, this person might feel she or he has no choice. But always there are options, even if one of them is not to make a decision. A decision — the selection of an option from among two or more alternatives — may increase or decrease options available for future decisions. Some consequences are irreversible. The decision made within an environment becomes part of the new environment, and may itself become one of the constraints or facilitators in a new setting. This is another example of the interdependence of any series of learning experiences and decisions.

The theory allows for modifications by future events. In no sense is it intended as a final statement. It should be congruent with presently known facts but it should also suggest further research that may lead to modifying part or all of the theory itself.

## FACTORS THAT INFLUENCE THE NATURE OF CAREER DECISION MAKING (CDM)

Four categories of influencers are posited:

### 1. Genetic Endowment and Special Abilities

A person is born with certain inherited qualities that may set limits on that individual's educational and occupational preferences, skills, and selections. Following are some illustrative, although not exhaustive, factors that may well make a difference

— Race

— Sex

— Physical appearance and characteristics, including physical defects or handicaps that cannot be changed.

The evidence is not clear as to the genetic and environmental components of various special abilities. It is not essential for purposes of this theory to know at this point exactly what portion of the variance is due to genetic or environmental influencers, but it should be recognized that the possibility exists that certain individuals are born with greater or lesser predispositions to profit from certain types of learning experiences. Aspects of the following abilities might be attributed to such predispositions, while other parts obviously result from interactions with environmental influencers.

— Intelligence

— Musical ability

— Artistic ability

— Muscular coordination

### 2. Environmental Conditions and Events

Educational and occupational decision making is influenced to a large extent by factors usually outside the control of any one individual. Some events may be planned; many others are unplanned. These environmental conditions and events may be due to human action (social, cultural, political, or economic) or to natural forces (location of natural resources or natural disasters). As a result of these factors, certain events or conditions occur which influence the career preferences, skills, and plans and activities of the individual.

— *Number and nature of job opportunities.* As a result of historical forces and governmental policies, certain occupational opportunities are available in one setting that are not available in another. Opportunities to be an abalone fisherman exist in California but not in Arizona. Opportunities to be a department store Santa Claus are available in certain Western countries but not in Pakistan.

— *Number and nature of training opportunities.* Educational opportunities are available in different cultures through different social institutions. In the United States training is available through public schools, proprietary schools, the armed forces, apprenticeship programs in unions and industry, and through correspondence courses. Accessibility of these training alternatives varies considerably from one location to another.

—*Social policies and procedures for selecting trainees and workers.* Policies and procedures can change as a result of new laws or judicial decisions. For example, the use of certain aptitude tests has been restricted as a result of recent court decisions. Requirements for entering certain jobs may be modified. The requirements may be functional or nonfunctional but still have an influence on the career selection process. For example, the requirement of a high school diploma may influence certain people to finish their high school education even though a high school education is not necessary for successful performance on the job.

—*Rate of return for various occupations.* The ratio of potential pecuniary and non-pecuniary rewards to the costs of preparing for an occupation varies dramatically from one occupation to another. The rewards, the risks, and the costs of preparing for any given occupation can be different in different cultures and in different groups within the same culture, and can be changed within any given culture as a result of institutional or governmental action. Trends in the rate of return for different occupations may be identified and affect future planning.

—*Labor laws and union rules.* Rules for joining labor unions can affect the number of new members, the number of job opportunities, and the benefits.

—*Physical events such as earthquakes, droughts, floods, and hurricanes.* Disasters such as these can destroy the economy of a certain location such that individuals employed there can no longer continue the same type of work.

—*Availability of and demand for natural resources.* The owner of land on which oil was discovered under circumstances where there was a large demand for oil might understandably change his occupational activities.

—*Technological developments.* The invention of new techniques and products produces job opportunities that might have been unavailable a few years previously. Industrialized societies therefore produce different patterns of job opportunities than less developed societies.

—*Changes in social organization.* Setting up the social security system in the United States not only provided a large number of jobs for employees in the federal civil service system but it affected the career plans of many individuals.

—*Family training experiences and resources.* An individual is born or adopted into a family which has learned a certain religion, has adopted certain values, and which communicates certain expectations to the new child. Families differ in what they teach their youngsters and in the resources they have available to provide for them. Such differences produce conditions for the individual that may make a difference in that individual's educational and occupational preferences, skills, and selections.

—*Educational system.* The school organization, the administrative policies, the type and personality of teachers available to the individual can have a big influence on the skills learned and the degree to which the individual strives to achieve success in various endeavors.

—*Neighborhood and community influences.* Communities differ in the extent to which models of people working in different occupations are available, the extent to which peers have learned differential values, and the extent to which various cultural events are available and valued.

### 3. Learning Experiences

Educational and occupational decision making is also influenced by the individual's past learning experiences. The patterns of stimuli and reinforcement, their nature and scheduling are so exceedingly complex that no theory can adequately account for the infinite variations that influence the development of career preferences and skills and the making of career selections. Two categories of learning are used here in an overly simplified form to point out the types of experiences that have an impact on CDM.

—*Instrumental Learning Experiences (ILEs).* In these the individual acts on the environment in such a way as to produce certain consequences. An H-shaped figure will be used to represent an instrumental learning experience. Figure 1 presents a diagram to show the components in the ILE. Three general components are identified: antecedents, covert and overt behavioral responses, and consequences (including responses to these consequences which in turn become a part of subsequent learning experiences). The antecedents in the general model consist of factors such as those identified in the above three sections (e.g., the cultural setting, the social history of the particular group) and the stimulus characteristics of a particular task or problem that is presented to the individual. Behavioral responses consist of cognitive and emotional responses as well as overt actions. Consequences include both the direct effects produced by the action (self feedback, verbal feedback from other individuals, observable results of the action itself, immediate or delayed impact on other people) and the cognitive and feeling responses the individual makes when s/he experiences these consequences. Figure 1 also presents a specific example of antecedents, the overt component of behavior, and feedback component of the consequences in the fictitious case of "Roger." Other examples of instrumental learning experiences would include knitting a sweater, reading a book, hitting a baseball, saying hello to a stranger, cutting down a tree, making an angelfood cake, or kssing someone of the opposite sex. The skills necessary for successful career planning, development, and occupational or educational performance are learned through successive instrumental learning experiences.

—*Associative Learning Experiences (ALEs).* Learning experiences also occur when the individual's prevailing response pattern is a reaction to external stimuli. Observational learning in which the individual learns by observing real or fictitious models is included in this category of experiences.

Also incorporated here are experiences in which two events are paired in time or location such that the learner associates a previously neutral situation with some emotionally positive or negative reaction. Thus, for example, hearing or reading words that pair two things together can have an impact. For example, statements such as "All lawyers are crooked" or "Plumbers make a lot of money" or "Those who can, do; those who can't do, teach; those who can't teach, teach teachers." Such verbal stereotypes about occupations influence the relative attractiveness or unattractiveness of each occupation. These associations can be learned not only through words but through images on film, through reading in books, through observation of people employed in various occupations, and through direct experience. Individuals have a tendency to form generalizations about entire occupations from very few examples, and sometimes the first associations that are formed are the lasting ones.

The pairing of stimuli through the classical conditioning paradigm is also included here. For example, a boy who becomes nauseous at the sight of blood may generalize the association to conclude that becoming a physician is inappropriate for him.

The general model for associative learning experiences is represented in Figure 2 as an O-shaped diagram. For simplicity, the cognitive and

## FIGURE 1
Diagrams Representing Instrumental Learning Experiences (ILEs)

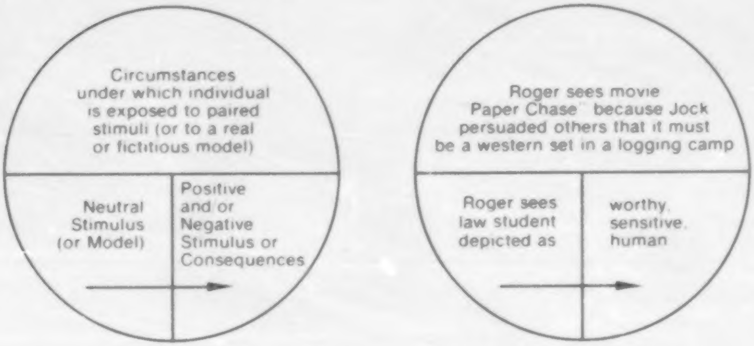
| Antecedents | Behaviors | Consequences |
|---|---|---|
| Genetic Endowment<br>Special Abilities and Skills | | Verbal Feedback from Self and/or Others<br>Direct Observable Results of Action |
| Task or Problem | Covert and Overt Actions | Covert Reactions to Consequences (Cognitive and Emotional Responses) |
| Planned and Unplanned Environmental (e.g., social, cultural, or economic) Conditions or Events | | Impact on Significant Others |

**General Model**

| Antecedents | Behaviors | Consequences |
|---|---|---|
| Roger, age 17, white, male, poor muscular coordination, superior writing skills. | | Teacher gives paper an "A" grade and writes "Well done." Roger thinks, "I could have done better if I had to." |
| Class in Government in which Roger has interacted with teacher and 29 others for 7 months. Teacher assigns paper on "A Famous Person in Government" due in 3 weeks. | Roger (who happened to have visited Jefferson Memorial in Washington) writes paper on Thomas Jefferson and turns it in on time. | Roger has a stimulating conversation with his father on how the U.S. would be different today if Jefferson had not lived. |
| Government class in U.S. high school where athletic success is dominant basis for male students | | Roger's classmate, Jock, sees teacher's comment and calls Roger a "teacher's pet." |

**Specific Example: "Roger"**

**FIGURE 2**
Diagrams Representing Associative Learning Experiences (ALEs)


Circumstances under which individual is exposed to paired stimuli (or to a real or fictitious model)
Neutral Stimulus (or Model)
Positive and/or Negative Stimulus or Consequences
Roger sees movie "Paper Chase" because Jock persuaded others that it must be a western set in a logging camp
Roger sees law student depicted as
worthy, sensitive, human

**General Model** **Specific Example: "Roger"**

emotional responses the individual makes as a reaction to these associations are omitted from Figure 2. The top of the diagram describes the circumstances under which the individual is exposed to paired stimuli or a model; the neutral stimulus or the model is represented in the lower left quadrant with an arrow pointing to the associated positive or negative stiumulus or the consequences received by the model. Figure 2 also presents a concrete example of stimulus pairing. It illustrates how "Roger" might learn that law students could be considered worthy, sensitive, human beings.

### 4. Task Approach Skills

As a result of as yet unexplained interactions between genetic and environmental influences, an individual brings to each new task or problem a set of skills, performance standards and values, work habits, perceptual and cognitive processes (such as attending, selecting, symbolic rehearsing, coding, encoding, reflecting, and evaluating responses) mental sets, and emotional responses. These task approach skills affect the outcomes of each task or problem. As a result of differential outcomes, the task approach skills become modified. For example, in high school Roger may cram for final examinations and get "A" grades, but in college his "cramming" habit may produce poor grades. The differential feedback may convince him to change his habits. Thus, task approach skills are both factors which influence outcomes and outcomes themselves.

## OUTCOMES OF INTERACTIONS AMONG INFLUENCERS

Each individual is exposed to innumberable learning experiences throughout the days, months, and years of her or his life. These experiences occur in many sequences. Their combinations and permutations are virtually infinite. Each instrumental learning experience is followed by various rewards and/or punishments at various intervals of time following the behavior and these varying schedules of reward, in combination with other learning experiences with their varying schedules of reward, produce an array of unique experiences which contributes to the diversity and individuality of the human species. Three kinds of consequences are pertinent to this analysis.

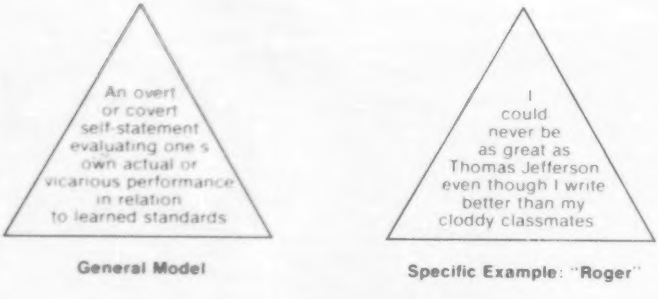
### 1. Self-Observation Generalizations (SOGs)

As a result of learning experiences, an individual can observe her/his own performance in relation to the performance of others or her/his own past performance and can make generalizations about it. Because the human being is capable of speech, s/he is able to utter statements which report these observations and conclusions. Comparison with others is usually part of the process, but idealized standards can be learned against which one's own behavior is compared. Figure 3 presents a diagram representing such a self-observation generalization. An SOG is defined as an overt or a covert self-statement evaluating one's own actual or vicarious performance in relation to learned standards. Figure 3 also presents a specific example of such an SOG in the case of "Roger." Not all SOGs are necessarily this explicit. A person may have a vague feeling of either confidence or discomfort, for example, when asked to give an impromptu speech. The feeling, as clearly articulated, might be, "I know I can give a succinct summary of my experience which will be well-received by other people because I have done this many times before." Or, if one's past experience had been different, the explicit statement might be, "Everyone will think I'm a fool if I stand up and try to talk in front of them, just like the last time someone made me do this."

Self-observations and conclusions are not necessarily accurate. A child might do an excellent job by objective standards but be told by her or his parents that it was poor. Without any other way to evaluate her or his own performance, s/he will learn to make negative evaluations about that particular behavior. When such negative evaluations are uttered, their expression may be reinforced by well-meaning friends who deny the negative statement and offer a more positive evaluation. Expressing negative self-observations then become a means of eliciting compliments from friends.

Self-observations and conclusions may be a function of the setting or the persons with whom one is associating. A boy may describe his bowling as superior in the presence of his girlfriend but inferior when he is with his buddies at the bowling alley. Such discrepancies can be explained as differential learning, a process involving discriminative stimuli and differential reinforcement. Positive self-observations and conclusions may be reinforced by some and punished by others. An individual accumulates both observations about her/his own performance and the generalizations to various situations but may not necessarily make explicit formula-

**FIGURE 3**
Diagrams Representing a Self-Observation Generalization (SOG)


An overt or covert self-statement evaluating one's own actual or vicarious performance in relation to learned standards
I could never be as great as Thomas Jefferson even though I write better than my cloddy classmates

**General Model**

**Specific Example: "Roger"**

tions of these observations or reactions until some suitable occasion for verbalizing them occurs.

Psychologists have devised various procedures for collecting individuals' self-observations and conclusions. Interest inventories are one such procedure. In some approaches to interest assessment, individuals are asked the degree to which they like, are indifferent to, or dislike various activities such as building a birdhouse or writing a letter. An individual may never have formulated an opinion on these questions before but, under the stimulus of the questionnaire, makes decisions about his degree of liking for each item. These "interests" are merely SOGs generalized from prior learning experiences.

Another such device is an adjective checklist in which the individual circles adjectives which s/he feels are descriptive of herself or himself, e.g., trustworthy, humorous, attractive, shy. These self-descriptive adjectives are the result of the individual's observing herself or himself through one or more learning experiences and arriving at specific self-conclusions.

People tend to remember their reactions to learning experiences but to forget the actual learning experiences themselves except when such experiences are particularly dramatic or traumatic. So some individuals can reliably report on whether they enjoy or do not enjoy reading science fiction but cannot give the names of specific science fiction books that they have read. The success of interest inventories in predicting future occupational selection is probably due to the fact that conclusions from various learning experiences are memorable and that people tend to continue doing those activities which produce pleasurable reactions.

Sometimes psychologists speak of interests as if they *cause* occupational selection. However, in the theory presented here, interests are seen as consequences of learning experiences. It is the learning experiences themselves that have an impact on an individual's future development of educational and occupational skills and selection of a course of study, an occupation, or a field of work.

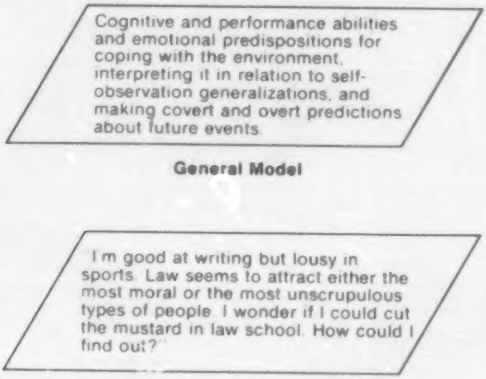
The one most important self-observation generalization for the purposes of this CDM study consists of *preferences:* preferring to work at one task, to avoid another; preferring to play one sport but to eschew another. These preferences become an important outcome of learning experiences — the building blocks of career decisions.

### 2. Task Approach Skills (TASs)

Human beings are capable of relating their observations of themselves and of their environment in such a way as to make possible projections into the future as well as inferences about the past. Task approach skills are defined as cognitive and performance abilities and emotional predispositions for coping with the environment, interpreting it in relation to self-oservation generalizations, and making covert or overt predictions about future events. They include work habits, mental sets, perceptual and thought processes, performance standards and values, problem orientating, and emotional responses. Figure 4 presents the general model and a specific example in the case of "Roger."

More specifically related to the purposes of the CDM study documented here, TASs include what may be termed CDM skills. Included are skills in value clarifying, goal setting, predicting future events, alternative generating, information seeking, estimating, re-interpreting past events, eliminating and selecting alternatives, planning, and generalizing (Krumboltz and Baker, 1973). Evidence about the extent to which people can apply these skills can be inferred from their behavior in making decisions and from their self-reports. Here are some self-reports

**FIGURE 4**
Diagrams Representing Task Approach Skills (TASs)


Cognitive and performance abilities and emotional predispositions for coping with the environment, interpreting it in relation to self-observation generalizations, and making covert and overt predictions about future events.

**General Model**

"I'm good at writing but lousy in sports. Law seems to attract either the most moral or the most unscrupulous types of people. I wonder if I could cut the mustard in law school. How could I find out?"

**Specific Example: "Roger"**

which illustrate TASs: "The last time I faced a problem like this I talked it over with my friends before deciding and I felt that it helped me reach a better decision. Maybe I'd better do that now." Or, "According to this pamphlet the demand for computer programmers is going to be much less ten years from now than it is now. But I wonder if the person who wrote this pamphlet really knows. I certainly do enjoy working with computers. Maybe by the time I'm old enough to take a full-time job the specific requirements will be quite different than they are now. I wonder if it does any good to plan ahead."

The nature of any TAS for an individual depends upon the sequence of her/his prior learning experiences, including any genetic factors that influenced those experiences. Individuals can acquire and perform sequentially related skills that both build on competencies already in their repertoires and enable them to complete tasks needed for making future career decisions.

### 3. Actions

Some behavior is the ultimate outcome of the processes described above. Each behavior generates consequences which affect the relative frequency of similar behaviors in the future.

This study of a social learning approach to CDM is specifically concerned here with *entry behaviors*, those actions which represent an overt step in a career progression. Examples include applying for a specific job, applying to a specific school or training program, accepting a job offer or training opportunity, accepting a promotion, and changing a college major.

## THE PROCESS OF CAREER PLANNING AND DEVELOPMENT

Consider an individual human being. She is born into the world with certain heredity. Her first view of the world is an antiseptic hospital with trained doctors and nurses in attendance. Immediately events begin impinging on her. She is slapped on the bottom. She feels cold. She cries. She finds a breast or a bottle. She cannot verbalize it yet but her subsequent behavior reveals that she might have been formulating an SOG which states, "Aha, crying produces warmth and milk for me." From her very first moment on earth, the pattern of learning experiences has begun.

A general model outlining factors affecting educational and occupational decision making is diagrammed in Figure 5. On the left side are the genetic factors represented in the newly-born individual. Time moves from left to right. The underlying environmental, economic, social, and cultural events and conditions impinge upon the individual's learning experiences as the arrows indicate. The individual's learning experiences are represented by the O's and H's defined in Figures 1 and 2, while triangles and parallelograms which have been defined in Figures 3 and 4 represent additional products and thought processes. The triple arrows after certain events represent the fact that the event which subsequently followed did not necessarily have to follow at that point. Each individual can make choices. Other alternatives were equally possible, though not necessarily under the control of the individual involved. The ellipses ( . . . ) indicate that large amounts of time and therefore large numbers of learning experiences as well as environmental events have been omitted in order to save space in this diagram. The general model shows that as a result of the interaction of genetic factors, environmental factors, and a complex sequence of learning experiences, she arrives at a certain point in time at her current activity. In no sense is that current activity the final career activity. As time continues, further events and learning experiences occur, and educational and occupational activities may change.

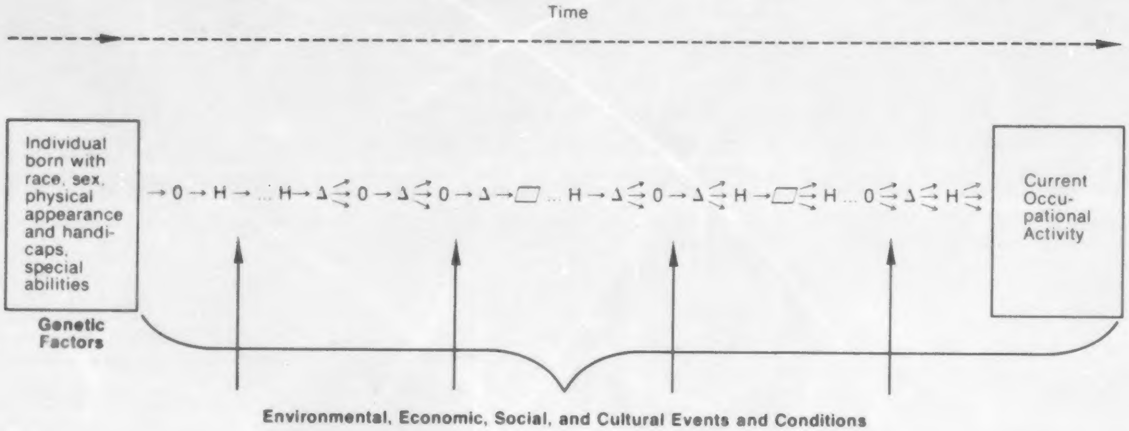
As discussed in the preceding sections, learning experiences produce not only preferences (emotional reactions of liking or disliking) for various activities but cognitive and performance skills as well. This individual can observe herself engaging in a skilled performance and can obtain reactions from other people about the quality of that performance.

The consequences of each learning experience affect the probability that she will have a similar learning experience in the future. A successful performance or positive feedback from other people increases the probability that certain types of activities will be repeated and therefore that certain types of skills will be developed to a greater extent. If she observes herself writing well and is praised by her teacher and her parents, she probably will continue to write and improve her performance. If she receives more negative feedback, she probably will write as little as possible.

It is the sequential cumulative effects of numerous learning experiences affected by various environmental circumstances and the individual's cognitive and emotional reactions to these learning experiences and circumstances that cause a person to make decisions to enroll in a certain educational program or become employed in a particular occupation. Actual enrollment as a student or employment is not a simple function of preference or choice but is influenced by complex environmental (e.g., economic) factors, many of which are beyond the control of any single individual. A change in learning experiences can produce a change in her stated educational or occupational preferences. Changes in the environment can affect the type of learning experiences she receives. Occupational preferences are highly unstable during adolescence, probably because of the variety of learning experiences to which young people are exposed.

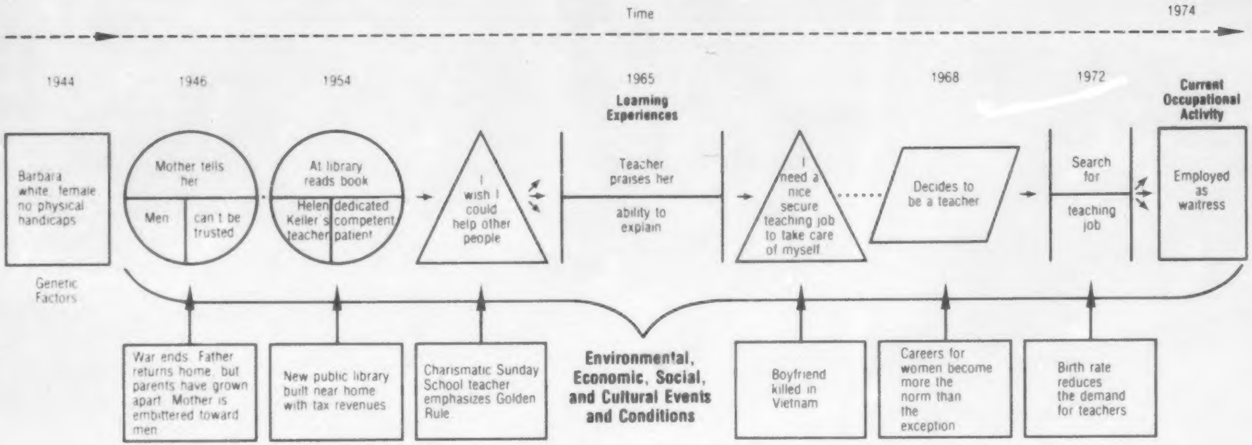
An abbreviated example of the general model applied to the case of "Barbara" is presented in Figure 6. As illustrated there, Barbara was born in the year 1944, influenced by the war, a new public library being built near her home, a charismatic Sunday School teacher, a boyfriend killed in

**FIGURE 5**
General Model of Factors Affecting Occupational Selection


Time
Individual born with race, sex, physical appearance and handicaps, special abilities
Genetic Factors
→ 0 → H → ... H → Δ 0 → Δ 0 → Δ → ▱ ... H → Δ 0 → Δ H → ▱ H ... 0 Δ H
Current Occupational Activity
Environmental, Economic, Social, and Cultural Events and Conditions

## FIGURE 6

Illustrative Excerpt of Factors Affecting "Barbara's" Occupation Selection


Time
1974
1944
1946
1954
1965
1968
1972
Learning Experiences
Current Occupational Activity
Barbara white, female no physical handicaps
Genetic Factors
Mother tells her
Men
can't be trusted
At library reads book
Helen Keller's teacher
dedicated competent patient
I wish I could help other people
Teacher praises her
ability to explain
I need a nice secure teaching job to take care of myself
Decides to be a teacher
Search for
teaching job
Employed as waitress
War ends. Father returns home, but parents have grown apart. Mother is embittered toward men
New public library built near home with tax revenues
Charismatic Sunday School teacher emphasizes Golden Rule.
Environmental, Economic, Social, and Cultural Events and Conditions
Boyfriend killed in Vietnam
Careers for women become more the norm than the exception
Birth rate reduces the demand for teachers

Vietnam, and various social factors affecting women's expectations to have careers. Also diagrammed and illustrated are a very few of the innumerable learning experiences which have some effect on her educational and occupational selections.

Figure 7 presents another example of the general model applied to the case of Barbara. This one depicts the development of an alternate occupational selection. Genetic factors, early environmental factors, and the early learning experiences and an SOG are left intact from the first example. Then the diagram shows by three arrows that alternate instrumental learning experiences may affect ultimate choice: Figure 7 departs from Figure 6 and shows how different environmental factors and different learning experiences and SOGs may affect the course of Barbara's career development. This diagram also shows that environmental conditions which impinge on Barbara's learning experiences may sometimes be changed by action of the individual, whereas others are so pervasive as to be impervious to an individual's efforts. In the latter case the individual can regress to an early stage or can choose a constructive compromise, as is illustrated in this example.

Figure 8 presents another alternate to Barbara's environmental conditions, learning experiences, and SOGs. In this example, Barbara's early experiences are once again left intact, for purposes of illustrating that the event that followed the triple arrows in the diagram did not necessarily have to follow at that point. These three figures present only three of many alternatives possible. Once again, the environmental conditions impinging on Barbara's options are illustrated. In the first instance she succumbs to the constraints imposed on her occupational selection by rising costs of tuition for graduate school and high cost of loans. She perceives the constraint as beyond the control of an individual and changes her occupational selection from teacher to secretary. In the second instance she decides to influence the environmental constraints and forms an agency to help remove those constraints.

It should be noted that occupational selections presented in these examples constitute a lifelong process, not one-time choices. Although Barbara is employed as a waitress in 1974 in Figure 6, as a general practitioner in a rural area in Figure 7, and as vice president of an employment agency in Figure 8, it should be recognized that further environmental events and additional learning experiences will occur which will undoubtedly alter Barbara's future educational and occupational activities.

## THEORETICAL PROPOSITIONS AND ILLUSTRATIVE HYPOTHESES

The preceding analysis suggests a number of testable propositions, several of which follow, and a large number of possible testable hypotheses, only a few of which can be mentioned for illustrative purposes here.

### 1. Factors Influencing Preferences

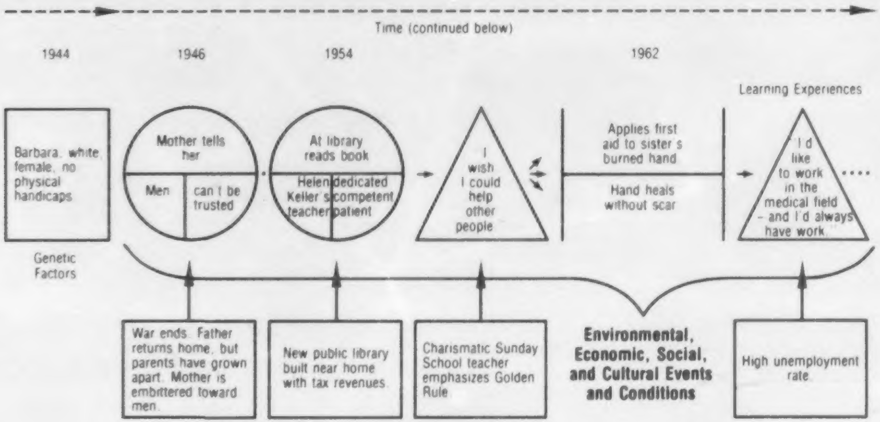
As used here, an educational or occupational preference is an evaluative self-observation generalization based on those learning experiences pertinent to any career task. The propositions that follow attempt to explain how these particular self-observation generalizations are acquired.

a. *Positive influences*

*Proposition IA1.* An individual is more likely to express a preference for a course of study, an occupation, or the tasks and consequences of a field of work if that individual has been positively reinforced for engaging in activities s/he has learned are associated with the successful performance of that course, occupation, or field of work.

**FIGURE 7**

Illustrative Excerpt of Alternative Factors Affecting "Barbara's" Occupation Selection


Time (continued below)
1944
1946
1954
1962
Learning Experiences
Barbara, white, female, no physical handicaps
Genetic Factors
Mother tells her
Men
can't be trusted
At library reads book
Helen Keller's teacher
dedicated competent patient
I wish I could help other people
Applies first aid to sister's burned hand
Hand heals without scar
I'd like to work in the medical field – and I'd always have work.
War ends. Father returns home, but parents have grown apart. Mother is embittered toward men.
New public library built near home with tax revenues.
Charismatic Sunday School teacher emphasizes Golden Rule.
Environmental, Economic, Social, and Cultural Events and Conditions
High unemployment rate.

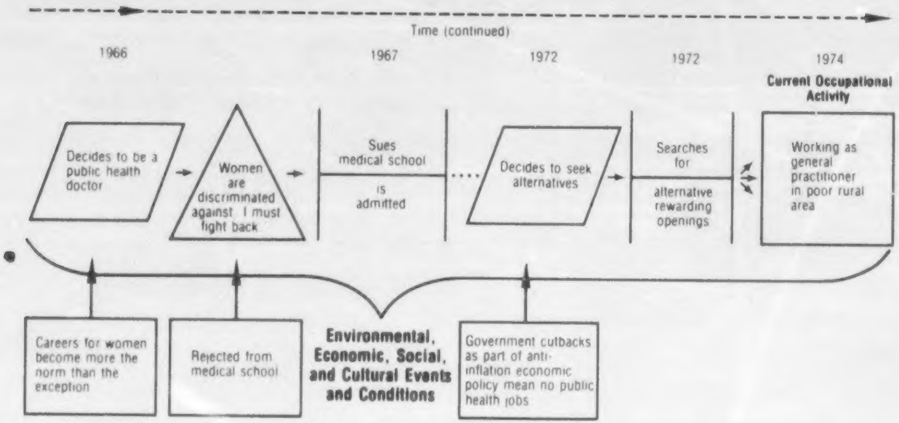
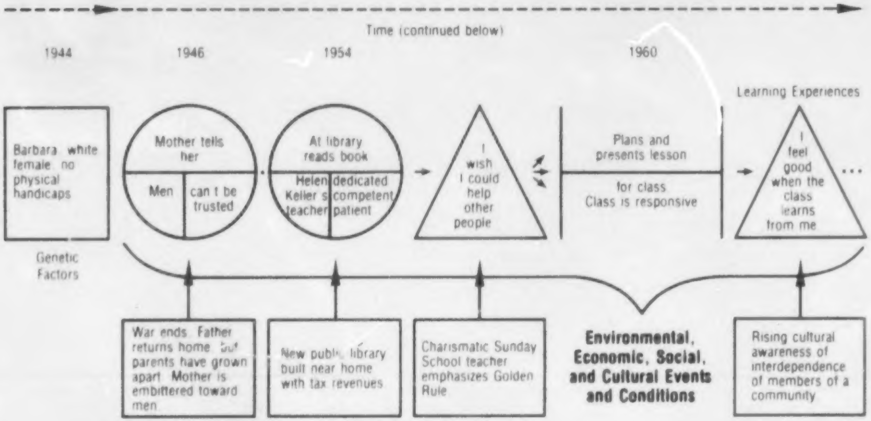
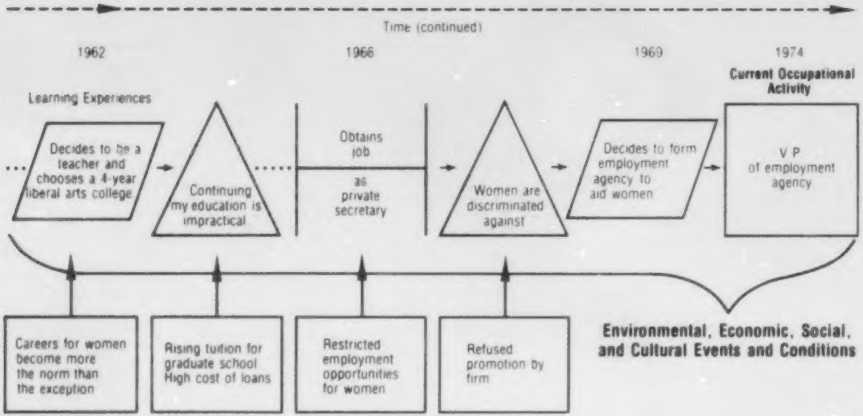

Time (continued)
1966
1967
1972
1972
1974
Current Occupational Activity
Decides to be a public health doctor
Women are discriminated against. I must fight back
Sues medical school
is admitted
Decides to seek alternatives
Searches for
alternative rewarding openings
Working as general practitioner in poor rural area
Careers for women become more the norm than the exception
Rejected from medical school
Environmental, Economic, Social, and Cultural Events and Conditions
Government cutbacks as part of anti-inflation economic policy mean no public health jobs

FIGURE 8
Illustrative Excerpt of Second Set of Alternative Factors Affecting "Barbara's" Occupation Selection


Time (continued below)
1944
1946
1954
1960
Learning Experiences
Barbara: white female, no physical handicaps
Genetic Factors
Mother tells her
Men
can't be trusted
At library reads book
Helen Keller's teacher
dedicated competent patient
I wish I could help other people
Plans and presents lesson
for class
Class is responsive
I feel good when the class learns from me
...
War ends. Father returns home, but parents have grown apart. Mother is embittered toward men
New public library built near home with tax revenues
Charismatic Sunday School teacher emphasizes Golden Rule
Environmental, Economic, Social, and Cultural Events and Conditions
Rising cultural awareness of interdependence of members of a community


Time (continued)
1962
1966
1969
1974
Current Occupational Activity
Learning Experiences
Decides to be a teacher and chooses a 4-year liberal arts college
Continuing my education is impractical
Obtains job
as private secretary
Women are discriminated against
Decides to form employment agency to aid women
V P of employment agency
Careers for women become more the norm than the exception
Rising tuition for graduate school High cost of loans
Restricted employment opportunities for women
Refused promotion by firm
Environmental, Economic, Social, and Cultural Events and Conditions

*Illustrative Hypothesis:* Boys who are reinforced for their basketball performance are more likely to indicate an interest in a basketball career than are those who are not so reinforced.

Why are some boys reinforced for basketball playing and others are not? A boy whose heredity and nutritional environment enable him to grow six feet ten inches tall is more likely to be reinforced by his basketball coach than a boy who grows to be only five feet two inches. Genetic and environmental factors play a major role in which learning experiences get reinforced.

*Proposition IA2.* An individual is more likely to express a preference for a course of study, an occupation, or the tasks and consequences of a field of work if that individual has observed a valued model being reinforced for engaging in activities s/he has learned are associated with the successful performance of that course, occupation, or field of work.

*Illustrative Hypothesis:* Tenth grade girls assigned the *Biography of Florence Nightingale* in English class will subsequently express greater interest in nursing than will those assigned *Moby Dick*.

Valued models can be vicarious as well as real. Models presented through literature, television, and motion pictures may well have as much influence as parents, relatives, and friends for at least some youngsters. The books that young people happen to read are a function of a number of environmental and cultural influences, many of which cannot be predicted. The models that young people identify with are those with which they happen to come in contact. Different cultural environments make available quite varied types of models.

*Proposition IA3.* An individual is more likely to express a preference for a course of study, an occupation, or the tasks and consequences of a field of work if that individual has been consistently positively reinforced by a valued person who models and/or advocates engaging in that course, occupation, or field of work.

*Illustrative Hypothesis:* Young people whose older friends and/or relatives report satisfaction with the benefits of a military career are more likely to express interest in joining one of the military services than are those whose relatives have not expressed such satisfaction.

Genetic and environmental influences are critical in influencing which people may qualify for and benefit from any given career. Certain physical standards are used by the military services in selecting members. People who are too short or too tall, or who were born with certain physical handicaps would not be eligible. Family influences play a big part in whether a given youngster comes in contact with people who model and/or advocate engaging in a particular occupation. Some people simply never come in contact with a person who, for instance, has chosen a military career and has been satisfied with it. Others have. The accident of birth therefore determines to a large extent the nature and type of models with whom an individual comes in contact.

*Proposition IA4.* An individual is more likely to express a preference for a course of study, an occupation, or the tasks and consequences in a field of work if that individual has been exposed to positive words and images associated with that course, occupation, field of work, or the activities related to it.

*Illustrative Hypothesis:* Students presented with a booklet describing and illustrating in glamorous terms a relatively unknown occupation will express more preference for that occupation than will students presented with objective facts about it.

The culture in which a young person grows up influences the type of words and images associated with various occupations. Some cultures will glamorize one occupation; others, another. Furthermore, what constitutes "glamour" depends upon the values that a particular culture manifests.

b. *Negative Influences*

*Proposition IB1.* An individual is less likely to express a preference for and more likely to express a rejection of a given course of study, an occupation, or the tasks and consequences of a field of work if that individual has been punished and/or has not been reinforced for engaging in activities s/he has learned are associated with successful performance of that course, occupation, or field of work.

*Illustrative Hypothesis:* Children who have received low grades in mathematics are more likely than are those who received high grades to express rejection of any career in which mathematics is said to be an important skill.

Some students happen to be exposed to skillful mathematics teachers; others are less fortunate. Those who are well taught learn mathematics step by step, master it well, and learn to enjoy it. Others find the tasks coming to them in such a sequence or at such a rate that they cannot succeed. The differential reinforcement and punishment provided by the schools undoubtedly leads many people to reject occupations which entail tasks they have come to hate.

*Proposition IB2.* An individual is less likely to express a preference for and more likely to express a rejection of a given course of study, an occupation, or the tasks and consequences of a field of work if that individual has observed a model receive punishment and/or little or no reinforcement for engaging in activities s/he has learned are associated with the successful performance of that course, occupation, or field of work.

*Illustrative Hypothesis:* College students whose closest friends were trained to be teachers but could not find jobs upon graduation will be more likely to reject teaching as a career than will those whose closest friends were trained as teachers and did find teaching jobs.

Economic factors play a major role in influencing the number of models which can be reinforced for particular kinds of training activities. The change from a teacher shortage to a teacher surplus has certainly influenced the number of people expressing a preference for teaching as a career. Observing what happens to influential models who fail to be reinforced for their choices can probably lead to lowered preference for those same choices.

*Proposition IB3.* An individual is less likely to express a preference for and more likely to express a rejection of a given course of study, occupation, or the tasks and consequences of a field of work if that individual has been consistently positively reinforced by a valued person who expresses negative opinions about the activities or persons who engage in that course, occupation, or field of work.

*Illustrative Hypothesis:* Children of parents who ridicule or degrade occupations requiring manual skill will express more rejection of those occupations than will children whose parents make no value judgments about those occupations.

Comments directed to or even accidentally overheard by children may influence their expressed preferences for certain jobs. People will tend to adopt the opinions of those who positively reinforce them. It is also possible that people will tend to reject the opinions of those who punish them. A number of other hypotheses could be generated on the interactions of reinforcement and/or punishment, the opinions of the reinforcing agent or the punishing agent, and the resulting opinions of the recipient. The persons with whom one happens to come in contact can therefore have a great influence upon the expressed preferences for various occupations.

*Proposition IB4.* An individual is less likely to express a preference for and more likely to express a rejection of a given course of study, an occupation, or the tasks and consequences of a field of work if that individual has been exposed to negative words and images associated with that course, occupation, field of work, or activities related to it.

*Illustrative Hypothesis:* Children seeing a motion picture depicting police officers as corrupt will be more likely to reject law enforcement as a career than will those seeing a factual documentary on law enforcement.

The motion picture and television media probably play an influential role in generating preferences for or against various occupations. It could be speculated that the current popularity of medical and legal training owes a good deal to the influence of Marcus Welby and Perry Mason.

## 2. Factors Influencing CDM Skills

CDM skills are a subset of task approach skills pertinent to occupational and educational decision making. Propositions in this section attempt to explain how these particular skills are acquired.

a. *Positive Influences*

*Proposition IIA1.* An individual is more likely to learn the cognitive and performance skills and emotional responses necessary for career planning, self-observing, goal setting, and information seeking if that individual has been positively reinforced for those responses.

*Illustrative Hypothesis:* High school students who are given a structured course in decision-making skills and whose efforts in that course are consistently rewarded and never punished will be more likely to apply those decision-making skills in future decision problems than will those high school students not receiving such a course.

Educational institutions may well be able to influence the degree to which people learn how to take control of their own career decisions. CDM is not exclusively the result of events happening to an individual but can also be shaped by an individual's own actions. But people need to know what kind of actions are likely to have some positive results for them. Systematic instruction can be designed to increase the probability that people can formulate and select intelligently from options that are presented to them or that they may have designed for themselves.

*Proposition IIA2.* An individual is more likely to learn the cognitive and performance skills and emotional responses necessary for career planning, self-observing, goal setting, and information seeking if that individual has observed real or vicarious models engaged in effective career decision-making strategies.

*Illustrative Hypothesis:* Students who observe a CDM film in which the models are depicted as being positively reinforced for engaging in the process will be more likely to engage in a similar process than will students not exposed to the same film.

Films, books, television programs, as well as the opportunity to observe real people wisely engaging in decision-making activities can probably have a great deal of influence on the extent to which young people will learn decision-making skills themselves. Experiments can be designed to determine the exact nature of such experiences that will make them most effective for youngsters of various backgrounds contemplating decisions of various types.

*Proposition IIA3.* An individual is more likely to learn the cognitive and performance skills and emotional responses necessary for career planning, self-observing, goal setting, and information seeking if that individual has access to people and other resources with the necessary information.

*Illustrative Hypothesis:* Students in schools that set up procedures for making career information easily accessible in meaningful ways will develop CDM skills to a greater extent than will students in schools not providing such opportunities.

Educational environments which provide needed CDM resources will probably produce superior decision-making skills. However, the resources need to be tailored to the entering skill level of the students and need to be made interesting and pertinent to the target population. Resources include not merely descriptive materials about occupations, but simulated job experiences, opportunities to talk with people engaged in various occupations, and even opportunities to work for short periods of time in close association with people in various occupations.

b. *Negative Influences*

*Proposition IIB1.* An individual is less likely to learn the cognitive and performance skills and emotional responses necessary for career planning, self-observing, goal setting, and information seeking if that individual has been punished or not reinforced for such behaviors.

*Illustrative Hypothesis:* Children whose attempts to make their own plans and decisions are consistently punished or overruled will develop less effective decision-making skills than will children whose planning efforts are reinforced or merely ignored.

Planning can be made an aversive activity. When plans are constantly upset by unforeseen factors, a youngster may develop the view that such planning is useless since events are out of her or his control.

*Proposition IIB2.* An individual is less likely to learn the cognitive and performance skills and emotional responses necessary for career planning, self-observing, goal setting, and information seeking if that individual has observed real or vicarious models receive punishment and/or little or no reinforcement for attempting to engage in CDM activities.

*Illustrative Hypothesis:* Young people who associate with peers who reject the usefulness of career planning and believe that fate will make their plans are less likely to develop decision-making skills than are those students who associate with peers who are committed to the notion of career planning and the possibility of self-control.

Peer influences play a big part in young people's lives, but peers are only one of the sets of models. Parents whose own careers have been frustrated may explicitly ir implicitly model the view that fate controls one's life and that therefore the best course of action is to take the most expedient step at the moment rather than plan for the future.

*Proposition IIB3.* An individual is less likely to learn the cognitive and performance skills and emotional responses necessary for career planning, self-observing, goal setting, and information seeking if that individual has little or no access to people and other resources with the necessary information.

*Illustrative Hypothesis:* Persons denied access to simulated vocational problem-solving materials will engage in less career exploration than will individuals who are given successively greater exposure to such simulated vocational problem-solving materials.

Critical experiences may be designed to encourage active career exploration. The fact that many young people have no idea what it is they want to do is probably due to the fact that they have had such limited experience with actual occupational activities. The more activities that can be provided for them related to occupations, the more they can learn what it is they like and dislike, what they can and cannot do, what they want to learn and do not want to learn, and what they want to find out about next.

### 3. Factors Influencing Entry Behaviors into Educational or Occupational Alternatives

Given the acquisition of preferences, emotional responses, and cognitive and performance skills through various learning experiences, the propositions in this section attempt to explain some factors that account for the actual entry behaviors into occupations, training programs, or educational courses of study.

a. *Positive Influences*

*Proposition IIIA1.* An individual is more likely to take actions leading to enrollment in a given course or employment in a given occupation or field of work if that individual has recently expressed a preference for that course, occupation, or field of work.

*Illustrative Hypothesis:* People entering plumbing apprenticeships will express a higher degree of interest in plumbing than will people of the same age and sex who are not entering plumbing apprenticeships.

Perhaps it seems obvious that expressed preference and actual choice will correspond. However, it is necessary to make explicit that the preferences generated through the procedures described under the first set of propositions above will be reflected in the actual actions taken by those individuals. However, preferences change over time. It is only the most recently expressed preference that is of concern at the time action is taken. This means that recent events can have an influence upon both preferences and actions. Educational and occupational preferences are not established at an early age to remain stable ever after. The process is in a constant state of flux as a result of constantly changing circumstances.

*Proposition IIIA2.* An individual is more likely to take actions leading to enrollment in a given course or employment in a given occupation or field of work if that individual has been exposed to learning and employment opportunities in that course, occupation, or field of work.

*Illustrative Hypothesis:* Communities that make available training opportunities as dental hygienists will find more people in that community seeking to become dental hygienists than will occur in equivalent communities where such training is not made available.

Again it may seem obvious that the number of trainees will vary as a function of the number of training opportunities. But it is important to note that the economic environment plays a big role in what occupations people actually enter. Individuals make choices among concrete alternatives. Actual entry into occupations or training is a function of available opportunities and the chance to find out about those opportunities.

*Proposition IIIA3.* An individual is more likely to take actions leading to enrollment in a given course or employment in a given occupation or field of work if that individual's learned skills match the educational and/or occupational requirements.

*Illustrative Hypothesis:* Individuals who become professional football players will have superior muscular coordination compared to that of individuals who become accountants.

Traditional aptitude tests have not provided clear distinctions between people entering various occupations. However, for certain occupations there are learned skills (cognitive and performance) which are necessary, skills which are not measured by traditional aptitude tests. Individuals who have learned to pound a nail without bending it are more likely to become carpenters than are individuals who constantly bend the nail after it is half way into the wood. Opportunities vary for people to learn these skills depending upon the training opportunities they have had, the models they have been exposed to, the cultures that they have grown up in, and the genetic factors that enable them to learn the skills.

b. *Negative Influences*

*Proposition IIIB1.* An individual is less likely to take actions leading to enrollment in a given course or employment in a given occupation or field of work if that individual finds that the cost of preparation for that occupation is excessive in relation to future economic, social, and personal rewards.

*Illustrative Hypothesis:* Providing scholarship money for medical school training will increase the probability that poverty level students who are otherwise qualified will enter medical training.

The cost-benefit ratio of preparation to reward in occupations plays an important part in which individuals aspire to which occupations. By reducing the cost of preparation or by increasing the rewards associated with successful performance, a society can alter the nature and number of individuals entering each occupation.

*Proposition IIIB2.* An individual is less likely to take actions leading to enrollment in a given course or employment in a given occupation or field of work if that individual is denied access to the minimum resources necessary for entering that occupation or field of work.

*Illustrative Hypothesis:* Among students aspiring to become airline pilots, those who are admitted to Air Force or Navy pilot training programs will be more likely to enter the occupation of airline pilot than will those who are denied access to such training.

A society can make training for certain occupations so expensive that relatively few people can afford it unless they somehow are given special access paid for by the society at large. Pilot training is just one example.

## IMPLICATIONS FOR COUNSELORS AND CLIENTS

To the extent that this social learning view of career selection bears some resemblance to reality (and the degree to which that resemblance can be checked through empirical research), some important views and implications emerge for counselors and clients:

1. Occupational placement is the result of a complex interaction of genetic components, environmental events and conditions, and learning experiences which result in the development of various task approach skills.

2. Career selection is a mutual process influenced not only by decisions made by each individual involved but also by social forces which affect occupational availability and requirements. People select, and are selected by, occupations.

3. Career selection is a lifelong process. It does not take place at one point in time, but is shaped by events and decisions that occur from infancy through the retirement years.

4. Career selection is caused, not accidental, but the interaction of causal events is so complex that the prediction of occupational selection for any one individual is virtually impossible with any degree of certainty.

5. Career indecision is due to the unsatisfactory nature or an insufficient number of career-relevant learning experiences or to the fact that the person has not yet learned and applied a systematic way of making career decisions. Indecision is a natural result of not yet having had certain learning experiences. An undecided person has no reason to feel guilty or inadequate.

6. Career counseling is not merely a process of matching existing personal characteristics with existing job characteristics, but instead is a process of opening up new learning experiences and motivating a client to initiate career-relevant exploratory activities.

7. The responsibilities of a career counselor, then, are as follows:

(1) To help the client learn a rational sequence of career decision-making skills,

(2) To help the client arrange an appropriate sequence of career-relevant exploratory learning experiences, and

(3) To teach the client how to evaluate the personal consequences of those learning experiences.

## REFERENCES

Krumboltz, J. D., & Baker, R. D. Behavioral counseling for vocational decisions. In H. Borow (Ed.), *Career Guidance for a New Age*. Boston: Houghton Mifflin, 1973, 235-284.

Krumboltz, J. D., Mitchell, A. M., & Gelatt, H. B. Applications of a social learning theory of career selection. *Focus on Guidance*, in press.

Mitchell, A. M., Jones, G. B., & Krumboltz, J. D. (Eds.). *A Social Learning Theory of Career Decision Making*. Final Report, Contract No. NIE-C-74-0134. Palo Alto, Calif.: American Institutes for Research, 1975.

# Causal Inference Among Variables Related to Career Decision Making: The Chicken or the Egg

RICHARD A. KASS,
JOHN R. MORELAND,
VINCENT A. HARREN, and
HOWARD E. A. TINSLEY
Southern Illinois University

## ABSTRACT

Four hundred and thirty-eight men and women college students participated in a longitudinal study examining the causal relationships among career progress, sex-role attitudes, and cognitive styles. Students completed the battery of instruments twice, at five or twelve-month intervals. The direction of causality among the variables was investigated by cross-lagged panel comparisons. The major findings suggested that changes in sex-role attitudes and cognitive styles were a result of changes in career decision variables. Sex-role attitude changes followed cognitive style changes, and attitudes concerning the ascription of sex-role appropriate behavior to others produced changes in the self-ascription of sex-role attitudes. The implications of these results are discussed in terms of Super and Tiedeman's theories of career implementation.

Many authors have discussed the negative, restrictive impact of traditional sex-role socialization both for women (Horner, 1972; Hoffman, 1972) and for men (Pleck & Sawyer, 1974; David & Brannon, 1976). Career decision making and career-related choices are excellent examples of areas in which differential socialization has restricted the range of alternatives from which either sex can choose. Interest in this area has led to attempts to differentiate between career-oriented and homemaker-oriented women (e.g., Richardson, 1975; Tinsley & Faunce, in press), or among career-oriented women, those who choose traditional (female dominated) careers versus those who choose nontraditional careers (Nagely, 1971; Wolkon, 1972; Tangri, 1972; Almquist, 1974; and Crawford, 1978). In a recent study by the present investigators (Harren, Kass, Tinsley, & Moreland, in press), we found that students' choices of gender-dominant occupations were influenced by gender, the self-ascription of feminine qualities, attitudes toward the sex-role appropriate behavior of women, and degree of cognitive complexity in judging female-dominant occupations.

These studies reflect the assumptions that sex-role socialization

---

The project reported here was performed pursuant to a grant from the National Institute of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the National Institute of Education should be inferred.

RICHARD A. KASS, JOHN R. MORELAND, VINCENT A. HARREN, and HOWARD E. A. TINSLEY are with the Department of Psychology, Southern Illinois University, Carbondale, Illinois. The authors wish to thank Dr. John A. McKillip for his consultation on the statistical procedures.

This report reprinted by permission of its authors.

causes men and women to hold different self views, which in turn mediates the development of somewhat different cognitive characteristics. The sex-role related aspects of the self-concept and these cognitive dimensions are then assumed to causally influence the process and outcome of career-related decision making.

Such an ordering of causal influences actually has a very strong base in career development theory. For example, Super and his associates (Super, 1953; Super, Starishevsky, Matlin, & Jordaan, 1963) have proposed that one's vocational self-concept is implemented through one's occupational roles. A good career selection is based upon the choice of a career which allows for the expression of the self. Such selection must be predicated on the existence of a well crystallized self-concept prior to the execution of a particular decision.

There is considerable empirical support for such a causal ordering. Barrett and Tinsley (1977a, 1977b) have reported evidence that the frequently documented relationship between self-esteem and the ability to make a satisfying vocational decision is, in fact, a function of the vocational self-concept crystallization of the individual. Horner (1972) has shown that women experience fear of success when their behaviors are discrepant with their standards of femininity. Bem and her associates (Bem, 1974; Bem & Lenny, 1976; Bem, 1977) have shown that sex-role related aspects of men and women's self-concepts influence their behavior in a number of laboratory tasks. Bodden and Klein (1972) have demonstrated that cognitively complex individuals were more likely to make occupational choices consistent with their Holland codes than were cognitively simplistic persons. In our own work (Harren, Kass, Tinsley, & Moreland, 1978), we recently concluded that students' satisfaction with their choice of academic major was influenced by their progress in the decision-making process. This progress was, in turn, causally influenced by their decision-making styles, sex-role related aspects of their self-concepts, and their attitudes about the sex-role appropriate behavior of men and women.

While these studies support the causal ordering described above, they fail to be adequate tests of causality. Because their measures were collected from the subjects at only one point in time, their conclusions are based on essentially correlational analyses. Harren et al. (1978, in press), for example, used a path analysis procedure which required that an assumption about the direction of causality among the variables be made based upon prior theoretical considerations. An additional assumption of path analysis is that any variable outside the investigated variables is not correlated with more than one of the path variables. This eliminates by prior assumption the third variable hypothesis which plagues correlational studies.

By analyzing data collected from the same subjects at two different points in time, one can make much more definitive statements about causality. The present study represents a re-examination of the causal relationships among these variables provided by a longitudinal design employing a cross-lagged panel analysis. Cross-lagged panel analysis (CLPA) requires neither an *a priori* assumption of directionality, nor the assumption of no third variable effect. CLPA is, in fact, a test for the third variable effect or "spuriousness" (Kenny, 1975). If the hypothesis of a spurious relationship between two variables is rejected by CLPA, then the direction of causality can be determined *a posteriori* by the differences in size of the cross-lagged correlations. In this manner, CLPA provides a more empirical examination of the causal relationships among sex-role attitudes, cognitive style, the decision-making process, and choosing a college major.

Two major questions concerning the causal relationships among these variables are addressed in this paper. First, do the sex-role attitude and cognitive style variables influence career progress (i.e., career decision-making process and choice of major) as most theorists and researchers assume? Or is it the case that the relationship often found between these two variables is due to the influence of changes in one's career progress on one's sex-role attitudes and cognitive style? The second question involves the causal ordering between the sex-role attitudes and cognitive style. Do sex-role attitudes influence cognitive style or does one's cognitive style affect one's sex-role attitude?

## METHOD

### Subjects

A random sample of undergraduates at Southern Illinois University at Carbondale was sent a letter in the fall of 1976. The letter explained the research project and offered $3.00 for participation. This is the sample Harren et al. (1978) used for their path analysis. Five months later, in the spring of 1977, another letter was sent to the seniors who had completed the time one instruments. This letter explained the desirability of a second testing session and again offered $3.00 for participation. In the fall of 1977, a second letter was sent to the original freshmen, sophomores, and juniors who had participated in the original testing session. The letter ws similar to that sent to the seniors except it now offered $5.00 for a return test session. Also in the fall of 1977, a new sample of freshmen were contacted for an initial testing session using the same procedure. These freshmen were recontacted for a second session five months later in the spring. The distribution by class and sex for all four class levels at both testing sessions is given in Table 1. The overall rate of participation was 64%.

### Instrumentation

Students were partitioned into three groups on the decisional status (DS) criterion variable. Group I consisted of those individuals who had not made a choice of major. Group II included those individuals who had made a choice of major but who indicated they were not highly satisfied with the choice (i.e., rated their satisfaction as ≤ 6 on a 9-point scale where 1 = Dissatisfied and 9 = Satisfied). Group III consisted of those individuals who had made a choice of major and who also indicated that they were highly satisfied (i.e., rated satisfaction as ≥ on a 9-point scale) with their choice.

The Assessment of Career Decision Making (ACDM) was developed by Harren (1976) to measure progress through Tiedeman and O'Hara's (1963) model of career decision making. Forty items of the ACDM concern the college student's progress in deciding on a college major and reflect progress through Tiedeman and O'Hara's first four psychological stages: exploration, crystallization, choice, and clarification. The instrument yields a decision-making task score which indicates progress towards choosing a major (DMTM). The higher the score, the further the student has progressed. The four measures of cognitive styles used in the present investigation included three decision-making style scales from the ACDM. These three scales measure a rational (DMS-R), intuitive (DMS-I), and dependent (DMS-D) career decision-making style. The fourth measure of cognitive style was the *Cognitive Differentiation Grid* (CDG; Bodden, 1970), which measures the extent to which an individual uses a range of cognitive constructs in rating various occupations.

Sex-role attitudes were measured using three instruments yielding five scale scores. *The Bem Sex Role Inventory* (BSRI; Bem, 1974) measures three self-attributed sex-role characteristics: femininity (BSRI-F), masculinity (BSRI-M), and androgyny. Bem's androgyny scale was not used in the present research because the nature of its scoring system suggests that it would have a curvilinear relationship with the other variables in this study. As an alternative to Bem's t-score androgyny scale, Harren et al. developed an androgyny scale (BSRI-X) based on the subjects' high and low scores on the masculine and feminine scales (4 = high on both scales; 3 = high on sex appropriate scale, low on sex inappropriate scale; 2 = low on sex appropriate scale; high on sex inappropriate scale; 1 = low on both scales). Two instruments were used to measure subjects' attitudes toward the sex-role appropriate behavior of men and women: the *Attitudes Towards Women Scale* (AWS; Spence & Helmreich, 1972; Spence, Helmreich, & Stapp, 1973) and the *Attitudes Towards Masucline-Transcendence Scale* (AMTS; Moreland & Van Tuinan, 1976). For a more complete description of the instruments and rationale for their inclusion in the original battery of tests, see Harren et al. (1978).

### Analysis

Among the first developers of CLPA as a method for inferring causal patterns in longitudinal data were Campbell and Stanley (1973). A more complete presentation can be found in Kenny (1975), while Calsyn (1976) presents useful guidelines for interpreting CLPA. Figure 1 depicts a cross-lagged panel diagram. The correlations $r_{x_1x_2}$ and $r_{y_1y_2}$ are called autocorrelations and represent the test-retest correlations for x and y, respectively. The correlations $r_{x_1y_1}$ and $r_{x_2y_2}$ are called synchronous correlations. CLPA assumes that $x_1$ and $y_1$ are measured at the same time (time 1) and $x_2$ and $y_2$ are measured at the same time (time 2). This is called the assumption of synchronicity (Kenney, 1975). Correlations $r_{x_1y_2}$ and $r_{x_2y_1}$ are the cross-lagged correlations. When certain assumptions concerning the synchronous correlations are met, the difference between the cross-lagged correlations will indicate whether x is "causally predominant" over y or y is "causally predominant" over x. The term "causally predominant" indicates that the one variable is a stronger cause of the other variable, although the other variable may be exerting a weaker reciprocal causal influence. In rare instances where the cross-lags would be nearly equal but opposite in sign, then the existence of a negative feedback system is probably the appropriate interpretation (Calsyn, 1976).

**TABLE 1**
A Class by Sex Distribution of Subjects Who Returned and Those Who Did Not Return for a Follow-Up Test Session

| | | Males | | Females | | |
|---|---|---|---|---|---|---|
| Class | Lag Time (Months) | R[a] | NR | R | NR | Return Rate |
| Freshmen | 5 | 44(1)[b] | 15 | 55(0) | 16 | .76 |
| Freshmen | 12 | 57(0) | 31 | 59(1) | 24 | .68 |
| Sophomores | 12 | 39(1) | 28 | 51(3) | 27 | .62 |
| Juniors | 12 | 46(3) | 24 | 44(1) | 22 | .66 |
| Seniors | 5 | 27(0) | 39 | 25(1) | 32 | .42 |
| Total | | 213(5) | 137 | 234(6) | 121 | .63 |

[a] R = return, NR = did not return.

[b] Number in parentheses is the number of subjects who returned but were subsequently dropped due to incomplete data.

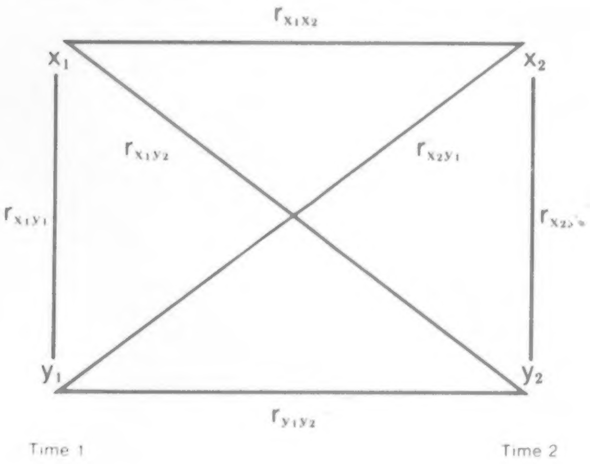
As an increase in x causes increases in y, an increase in y also causes decreases in x. A negative feedback system promotes stability in the system.

Causal inference from CLPA critically assumes that the causal determinants of x and y remain the same at both time 1 and time 2. Kenny (1975) refers to this as the assumption of stationarity. Only if the assumption of stationarity and synchronicity are met do differences between the cross-lagged correlations rule out the third-variable effect and indicate a causal relationship. Significant differences ($p \leq .05$) between cross-lagged correlations were determined by a Pearson-Filon z-test for correlated correlations (Kenny, Note 1). Kenny and Calsyn discuss a number of ways to test whether the assumptions of synchronicity and stationarity have been met. For a thorough discussion, the reader is referred to this work. Only the cross-lag panels meeting both of these assumptions are discussed in this paper.

CLPA is designed to err in the direction of failing to find a significant causal effect (Type II error) rather than mistakenly identifying spuriousness as a causal effect (Type I error). Consequently, both Kenny (1975) and Calsyn (1976) recommended using different samples and different time lags. In the present analysis, we have chosen to examine the data by analyzing each class sample with the data for the sexes combined. For these five independent analyses, the effect for sex was statistically partialled out. Some of the sample sizes were too small (N = 24) to perform a CLPA individually on each class and gender. Each independent panel analysis examined all possible panel pairs (55) from the eleven variables under investigation.

As in any longitudinal study, attrition is a problem. Both Kenny (1975) and Calsyn (1976) recommend using only those subjects who have complete data at both times. While this restricts the generalizability of the reported results, an estimation can

**FIGURE 1**
Cross-lagged Panel Correlations for the Variable x and y at Two Different Points in Time



be made of how similar the students who completed the project are to those students not completing the project. At each class level and for each sex, a t-test ($p \leq .05$) comparison was made of the differences between the returners and non-returners on all eleven variables. Significant differences were observed in only two of 110 comparisons, thus indicating that the attrition can be assumed to be due to factors other than the variables under investigation in this study.

## RESULTS

Table 2 summarizes the panel comparisons in those samples meeting the assumption of stationarity. Only the sophomore sample (N = 86) failed to meet this assumption. The left-hand column of Table 2 denotes the pair of variables found to have a causal relationship. The direction of the causal effect is represented by the direction of the arrows which appear in the column beneath the sample(s) in which that cross-lag comparison was statistically significant. An arrow with a plus sign indicates a simple causal relationship. Thus, in Table 2 the first arrow under the freshman (5 mo.) indicates that for this sample, an increase in progress through the decision making process towards choosing a college major causes an increase in the endorsement of BSRI masculine qualities. An arrow with a minus sign shows that an increase in one variable causes a decrease in the other variable. For example, the first negative arrow under freshmen who were tested at a 12 month interval signifies that an increase in decisional status from time 1 to time 2 causes a decrease in the use of the intuitive decision making style at time 2. The double arrow under the freshman sample (5 mo.) represents a negative feedback situation. An increase in the decision making process causes an increase in the self-ascription as androgynous. However, the negative sign arrow signifies that this increase in androgynous characteristics from time 1 to time 2 causes a corresponding decrease in the decision making process. Thus, there is a tendency for these two variables to reach a state of dynamic equilibrium.

Question one concerns the direction of causality between decision-making progress and sex-role attitudes, and cognitive styles. In Table 2 there are four instances of the causal predominance of decision-making progress influencing sex role and cognitive style rather than vice versa, and only one instance when a sex-role attitude influences the decision-making process. For juniors, making a satisfying choice of major (DS) causes an increase in their endorsement of sex-role self-concept as masculine (SRI-M). In a similar manner, progressing through the psychological decision-making stages (DMT-M) is also causally related to an increase in the self-ascription of masculinity for freshmen (5 mo.). Moreover, we find that progression through the decision-making process also produces an increase in the androgynous (BSRI-X) self-concept for the five-month freshman sample. However, as stated previously, this particular relationship also shows the reciprocal causal effect of increases of androgyny decreasing the decision-making process. These findings suggest, for freshmen and somewhat for juniors, that decision-making progress and making satisfying choices of major causes students to change their view of themselves to include a stronger emphasis on androgynous or instrumental qualities. See Moreland, Gulanick, Montague, & Harren (1978) for an interpretation of masculinity (BSRI-M) as instrumentality. With the exception of one bidirectional causal relationship, changes in the sex-role related aspect of the self-concept appear to follow decisive action, rather than decisive action being the result of changes in self-concept. We can reach similar conclusions about the causal relationships be-

## TABLE 2

Summary of Patterns of Causal Predominance Where Effects of Gender Are Statistically Partialled Out

| Variables Related Causally[a] | Samples<br>Freshmen 5 months N = 98 | <br>Freshmen 12 months N = 115 | <br>Juniors 12 months N = 86 | <br>Seniors 5 months N = 51 |
|---|---|---|---|---|
| DS, BSRI-M | | | $\xrightarrow{+}$ | |
| DS, DMS-I | | $\xrightarrow{-}$ | | |
| DMTM, BSRI-M | $\xrightarrow{+}$ | | | |
| DMTM, BSRI-X | $\xrightarrow{+}$<br>$\underset{-}{\leftarrow}$ | | | |
| DMTM, DMS-I | | $\xrightarrow{-}$ | | |
| AWS, DMS-R | | $\xleftarrow{-}$ | | |
| BSRI-F, DMS-I | $\xleftarrow{+}$ | | | |
| BSRI-X, DMS-I | | | | $\xrightarrow{-}$ |
| DMS-R, DMS-I | | | | $\xrightarrow{-}$ |
| AWS, BSRI-F | $\xrightarrow{+}$[b] | | | |
| AWS, AMTS | $\xrightarrow{+}$[b] | | | $\xrightarrow{+}$ |

*Note.* Only the panel comparisons with statistically different cross-lagged correlations are included.

[a] DS = decisional status; DMTM = decision-making task for college major; AWS = Attitudes Toward Women Scale; AMTS = Attitudes Toward Masculine Transcendency; BSRI-M = Bem Sex-Role Inventory masculine scale; BSRI-F = femininity scale; BSRI-X = androgyny scale; DMS-R = rational decision-making style; DMS-I = intuitive decision-making style; DMS-D = dependent decision-making style.

[b] These cross-lagged differentials were statistically significant only after the two variables were adjusted for changes in reliability (see Kenny, Note 1).

tween decisional status, decision-making progress, and the cognitive variables. For freshmen (12 mo.), increases in both decisional status and decision-making process cause decreases in utilization of the intuitive decision-making style (DMS-I).

Question two concerned the direction of causality between sex-role attitudes and cognitive styles. Two of these unidirectional causal relationships suggest the predominant influence of cognitive styles on sex-role attitudes rather than vice versa. Surprisingly, for freshmen (12 mo.) an increase in the rational decision-making style (DMS-R) produces decreases in liberal attitudes towards sex-role appropriate behavior of women (AWS). This finding was unexpected and there is no immediate apparent interpretation for it. Not so surprising is the finding that an increase in the intuitive decision-making style leads to an increase in endorsement of feminine qualities (BSRI-F) for freshmen (5 mo.). In only one instance do we see the effect of a sex-role attitude on cognitive style. For seniors, an increase in their self perception as androgynous causes a decrease in their intuitive decision-making style score.

The third set of findings is not related to our original hypotheses. When examining the intrarelationships among the sex-role attitudes and cognitive styles we find some interesting results. An increase in rational decision-making style cause a decrease in the intuitive style. Surprisingly we find that for freshmen (5 mo.) an increase in liberal attitudes concerning the sex-role appropriate behavior for women (AWS) increases the self-ascription of femininity (BSRI-F). Thus, self-ascription follows other-ascription and not vice versa. Moreover, for both freshmen (5 mo.) and seniors, increases in liberal attitudes concerning sex-role behavior appropriate for women causes an increase in liberal attitudes towards sex-role apropriate behavior for men.

## DISCUSSION

Harren, et al. (1978) reported that students' satisfaction with their choice of an academic major was apparently caused by their progress in the decision-making process. This, in turn, was causally influenced by their decision-making styles, sex-role related aspects of their self-concepts, and their attitudes about the sex-role appropriate behavior of men and women. They concluded that their findings were consistent with the bulk of the sex-role and counseling literature, which suggests that as one's attitudes, self-concept, and decision-making styles become more differentiated, one is able to better progress through the stages of the decision-making process and experience greater satisfaction with one's decisions. The results of the present study, based on data collected from the same subjects at two different points of time, raise serious doubts about the earlier conclusions of Harren, et al. (1978).

In our earlier work, we used cross-sectional data to test an *a priori* determined model of causal relationships between sex-role self-concept and attitudinal measures, cognitive style variables, and decision-making process and outcome indicators. In the present study, the use of CLPA on longitudinally obtained data has served to highlight the limitations of cross-sectional data in determining causal relationships. CLPA involves no *a priori* postulations of causal effects. Theory is required only for the selection of the variables which are to be studied. Short of laboratory controlled, experimental designs, CLPA is the most definitive approach available for determining causality among a set of variables. In fact, CLPA designs may have more external validity than laboratory experiments (Calsyn, 1976).

Inspection of Table 2 reveals only one instance in which a particular comparison is significant for more than one year level. There are probably a number of factors which are responsible for the lack of replication of particular panel combinations. As we mentioned in the method section, CLPA is not a statistically powerful test. Thus, a true causal relationship may not be detected and the hypothesis of spuriousness will be accepted. The lack of replication may also reflect true developmental changes in the manner in which the variables under investigation influence each other. Thus, inferences attributed to one or more of these samples may or may not generalize to more than one year level. The reader should interpret our conclusions as tentative research hypotheses and evaluate the following discussion on its heuristic merits.

The finding regarding the causal predominance of the career decision variables over the attitudinal and cognitive variables have some important implications for theories of career decision making and the career counselor. For example, Super, Starishevsky, Matlin, and Jordaan (1963) postulate that persons' career development depends on the degree to which their self-concept is formed and crystallized. Persons' vocational self-concepts are implemented through their occupational decisions. Thus, the resolution of developmental tasks presupposes a crystallized self-concept, such that the latter "causes" progress in the former. In contrast, Tiedeman and O'Hara (1963) assume that persons progress through stages of development in a cyclic fashion in which there are reciprocal, bidirectional person-environment interactions. This approach (Peatling & Tiedeman, 1977) assumes that as one defines self through one's self-reflective thoughts and feelings, one engages in activities which implement the self-concept and the consequences of these activities serves to further differentiate or redefine the self. The direction of effects found in the present study reflect the differentiation of the self following career implementation and are thus more consistent with the model proposed by Tiedeman and his associates than that proposed by Super and his associates.

These results have important implications for career counseling. The first is that focused interventions aimed solely at modifying specific attitudes (e.g., sex-role attitudes, self-concept clarification) in order to change specific behaviors (e.g., choosing a college major) may be overly simplistic. Such narrow goals for counseling do not take into account the bidirectional, reciprocal relationships found among these variables. A second implication is that counseling students toward satisfying career commitments will also cause cognitive and attitudinal changes in students and that these changes, in turn, will affect one's career decision making. A third implication is that the kinds of changes and their direction will vary across class levels, so that these factors need to be taken into account in assessing individual client's needs and in establishing goals for counseling.

The findings related to the direction of causality between sex-role attitudes and cognitive styles were not consistent with the results of the path analysis reported previously (Harren et al., 1978) in which it was assumed that sex-role attitudes influenced cognitive styles. Two of the three significant comparisons involving sex-role and cognitive measures suggests a direction of causal influence which is opposite to that posited in our earlier work. Thus, our future conceptual models which attempt to account for the growth on sex-role and cognitive measures must recognize that these sets of constructs exert a complex source of influences on each other. Our theories must reflect this interactional, bidirectional involvement.

The third set of findings revealed that self-conception of feminine qualities followed increases in liberal attitudes towards women's sex-role behaviors in general. In addition, liberalization of attitudes towards male appropriate behavior followed liberalization of attitudes towards female appropriate behavior.

These findings and the previous two sets of findings have some direct implications for counseling psychologists who have become increasingly involved in sex-role consciousness activities. Most models of consciousness raising are based upon a model which focuses participants' attention on the sex-role related aspects of their self concept (Brodsky, 1973; Farrell, 1975; Pogrebin, 1973; and Moreland, 1976). The assumption is that if individuals expand their view of themselves to include qualities typically ascribed to the opposite sex, that this will be followed by changes in peoples' attitudes toward role appropriate behavior for men and women, and increases in peoples' ability to make, and derive satisfaction from, decisions. Data from the present study suggest that changes in the sex-role related aspects of students self concepts may be facilitated by changes in their sex-role attitudes towards others, changes in their utilization of particular decision-making styles, or changes in their decision-making abilities.

A final implication, or perhaps a caveat to both researchers and counselors, is that we should hold more tentatively our cherished theoretical assumptions (e.g., career commitment involves the implementation of the self-concept; attitudes towards others follow changes in the self-concept).

Rather, we should resist our tendency to simplify and our desire for stability and recognize the complexity and changing nature of the person-environment interaction.

## REFERENCE NOTE

1. Kenny, D. A. Panel data analyses computer program. Duplicated Research Report, Harvard University, 1974b.

## REFERENCES

Almquist, E. M. Sex stereotypes in occupational choice: The case for college women. *Journal of Vocational Behavior*, 1974, *5*, 13-21.

Barrett, T. C., & Tinsley, H. E. A. Vocational self-concept crystallization and vocational indecision. *Journal of Counseling Psychology*, 1977, *24*, 301-307. (a)

Barrett, T. C., & Tinsley, H. E. A. Measuring vocational self-concept crystallization. *Journal of Vocational Behavior*, 1977, *11*, 305-313. (b)

Bem, S. L. The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 1974, *42*, 155-162.

Bem, S. On the utility of alternative procedures for assessing psychological androgyny. *Journal of Consulting and Clinical Psychology*, 1977, *45*, 196-205.

Bem, S., & Lenney, E. Sex-typing and avoidance of cross-sex behavior. *Journal of Personality and Social Psychology*, 1976, *33*, 48-54.

Bodden, J. L. Cognitive complexity as a factor in appropriate vocational choice. *Journal of Counceling Psychology*, 1970, *17*, 364-368.

Bodden, J. L., & Klein, A. J. Cognitive differentiation and affective stimulus value in vocational judgments. *Journal of Vocational Behavior*, 1973, *3*, 75-79.

Brodsky, A. The consciousness raising group as a model for therapy with women. *Psychotherapy: Theory, Research and Practice*, 1973, *10*, 24-29.

Calsyn, R. J. Guidelines for using cross-lagged panel correlations. *Representative Research in Social Psychology*, 1976, *7*, 105-119.

Campbell, D. T., & Stanley, J. C. Experimental and quasi-experimental designs for research and teaching. In N. L. Gage (Ed.), *Handbook of research on teaching*. Chicago: Rand McNally, 1963.

Crawford, J. D. Career development and career choice in pioneer and traditional women. *Journal of Vocational Behavior*, 1968, *12*, 129-139.

David, D. S., & Brannon, R. *The forty-nine percent majority: The male sex role*. Reading, Mass.: Addison-Wesley, 1976.

Farrell, W. *The liberated man: Beyond masculinity*. New York: Random House, Inc., 1975.

Harren, V. A. Assessment of career decision making. Progress report, May, 1976. Available from Vincent A. Harren, Department of Psychology, Southern Illinois University, Carbondale, Illinois.

Harren, V. A., Kass, R. A., Tinsley, H. E. A., & Moreland, J. R. Influence of sex role attitudes and cognitive styles on career decision making. *Journal of Counseling Psychology*, 1978, *25*, 390-398.

Harren, V. A., Kass, R. A., Tinsley, H. E. A., & Moreland, J. R. Influence of gender, sex-role attitudes and cognitive complexity on gender-dominant career choices. *Journal of Counseling Psychology*, in press.

Hoffman, L. W. Early childhood experiences and women's achievement motives. *Journal of Social Issues*, 1972, *28*, 129-155.

Horner, M. Toward understanding achievement related conflicts in women. *Journal of Social Issues*, 1972, *28*, 157-176.

Hunt, D. E. *Matching models in education*. Ontario Institute for Studies in Education, 1971.

Kenny, D. A. Cross-lagged panel correlations: A test for spuriousness. *Psychological Bulletin*, 1975, *82*, 887-905.

Moreland, J. R. A humanistic approach to facilitating college students learning about sex roles. *The Counseling Psychologist*, 1976, *6*, 61-64.

Moreland, J. R., Gulanick, W., Montague, E. K., & Harren, V. A. Some psychometric properties of the Bem Sex-Role Inventory. *Applied Psychological Measurement*, 1978, *2*, 249-256.

Moreland, J. R., & Van Tuinan, M. *The Attitudes Toward Masculinity-Transcendence Scale*. Carbondale: Department of Psychology, Southern Illinois University, 1976.

Nagely, D. Traditional and pioneer working mothers. *Journal of Vocational Behavior*, 1971, *1*, 331-341.

Peatling, J. H., & Tiedeman, D. V. *Career development: Designing self*. Muncie, Ind.: Accelerated Development, Inc., 1977.

Pleck, J. H., & Sawyer, J. (Eds.). *Men and masculinity*. Englewood Cliffs, N.J.: Prentice-Hall, 1974.

Progrebin, L. Rap groups: The feminist connection. *Ms.*, 1973.

Richardson, M. S. The dimensions of career and work orientation in college women. *Journal of Vocational Behavior*, 1974, *5*, 161-172.

Spence, J. T., & Helmreich, R. The Attitudes Towards Women Scale: An objective instrument to measure attitudes toward the rights and roles of women in contemporary society. *Journal of Supplement Abstract Service Catalog of Selected Documents in Psychology*, 1972, *2*, 66-67. (Ms. No. 617)

Spence, J. T., Helmreich, R., & Stapp, F. A short version of the Attitudes Towards Women Scale (AWS). *Bulletin of the Psychonomic Society*, 1973, *2*, 219-220.

Super, D. E. A theory of vocational development. *American Psychologist*, 1953, *8*, 185-190.

Super, D. E., Starishevsky, R., Matlin, N., & Jordaan, J. P. *Career development self-concept theory*. New York: College Entrance Examination Board, 1963.

Tiedeman, D. V., & O'Hara, R. P. *Career development: Choice and adjustment*. New York: College Entrance Examination Board, 1963.

Tinsley, D. J., & Faunce, P. S. Vocational interests of career homemakers. *Journal of Vocational Behavior*, in press.

# Synthesis

## RIPPLES: 1975-

### Deep Structure

We approached this review by first outlining the deep structure within which the theory of career development for white males is currently embedded. In this deep structure, the choice of an occupation is conceived to occur within the interaction of the self concept and action predicated upon that self concept. The processes of this interaction are outlined fairly clearly for the childhood, adolescent, and young adult phases of the occupational choice. Furthermore, the Holland and the Roe theories of occupational classification do a fairly good job of conveying the predictable variance from the ways in which persons presently satisfy themselves with the occupancy of their time to the ways in which they continue to occupy their time at needs satisfying work in a somewhat later time in their lives. However, the development of the career is less well marked for the middle and late adult stages of life. Furthermore, the theory has not been generalized so that it remains robustly inclusive of the career development of females and the poor as well as the white males. Finally, the theory is primarily based in the concept of choice, not in the concept of decision as we believe it should be.

### Emerging Themes

Our review of the research in career development published during the past five years indicated that the deep structure of theory in career development persists but that there are some newly emerging themes offering promise. Among the themes under investigation is the fundamental one: does career develop or not? It appears that there is less question of whether the career develops or not than there is of the question of how. Most people seem to take career development for granted. After all, most people experience that development in their own lives and more or less take it for granted. But few trouble to consider career to be constructible as we argue in this section.

Besides needing a change from the choice to the decision paradigm, career development theory needs additional explicitness. This latter need manifests itself through the publication, since 1971, of several theories written with behavior as the organizing theme. However, decision is also being advanced as the locus of the self constructed career and this line of thinking is broadening focus on the driving mechanism of career development from the interaction of self concept and action to thought and action. In this process, the principal paradigm for the driving force in career must shift from choice, where it has been stalled since about 1950, to decision. We consider this point in more detail later.

Age or stage limited theories of career development are also coming into being at this time. Career development during college instruction is particularly singled out for development of this kind. However, efforts are now being directed towards derivation of special theories for females, older adults, and groups with special needs. These efforts are necessary in order to make more explicit what we want to include in the more comprehensive and general theory which would be the more advantageous career development theory to have. But we must after all creep before we can walk. However, we must not forget that we want to walk and perhaps even eventually to run so that we should keep our minds on the provision of a more comprehensive and more general theory as well as work in the special regions of particular conditions.

Another theme coming into career development is that associated with the provision of an education which enhances career development. These efforts are clarifying our assumptions that career does develop and that we can facilitate that development rather than just waiting for nature to take its course. This is the force which makes the change from a choice to a decision paradigm as driving mechanism in career so important to the practice of career education, in which vocational education has played such an active part. When we can empower individuals to take responsibility for their decisions and lives, we will have provided a career education in which career development can be self sustained and constructed.

Our constitutional guarantees of equality are being honored actively at this juncture of our country's development. The rights of minorities and women to conditions of equity in life's chances are therefore being highly stressed as the Federal government strives to make its constitutional principles uniformly applied throughout the states of our federation. In this press, investigation of sex roles, stereotyping, and bias has accelerated. These investigations have generally found that the habits which have arisen when persons were not as conscious of the lack of equity in their life chances are hard to change. These habits do require us to change so that the pursuit of individual purpose and joyfulness can be possible for all. However, those who would change the individual by merely changing the environment are doomed to anger as they review the research on the imprint of sex roles, stereotyping and bias on occupational behavior. Individuals must also wake up as their environments change if they are to cooperate with the evolution of personkind during their lives by taking control of their development. This need emphasizes the importance of the swing from a choice to a decision paradigm in career development, a need which we pursue as our integrating theme in this section.

The marked changes taking place in our society and its technology at this stage in our country's development have also brought the late adult years into the limelight of investigation in career. We are finding that adults must continue to learn and grow if they are to remain current with the increased rapidity in social change. Unless self constructing activity can quickly become a part of the adult years, an increasing number of adults will be wondering where the game of life went. They will no longer consider themselves playing in it. And we rob individuals of confidence in their control of themselves and their society at dire social risk. The emerging literature on the development of the career in adult life offers promise of helping in these needed personal developments. Perhaps America needs some new shibboleths such as "There's nothing wrong with America which we grey-headed Americans couldn't cure." Or, "Wake up grey-headed America! Lend your experience to devising the operating manual for Spaceship Earth."

Finally, the measurement and evaluation of parts of career development continues as a strong theme in its research literature. A great deal of attention was given to making interests less dominated by sex stereotyping. Several new instruments came into being in the past five years. These instruments have fortunately highlighted processes in career development, an area in which our instrumentation has weakness.

## Pebbles with Ripples

In the prior section, we cast four pebbles into the currently calm pond of the deep structure of career development theory which is presently characterized by the research themes we just summarized. Those pebbles were (1) an overview of the cross sectional story of early career development, (2) a comparison of the predictive powers of three occupational classification systems, (3) a social learning theory of career selection, and (4) a chicken and egg study. When we introduced those studies, we suggested you consider (1) the topic or focus, (2) the purpose, (3) the method, (4) the findings, and (5) the implications of each as you read it. We felt that doing so would direct your learning so that you could hierarchically restructure your understanding of career development theory as you read the studies. We therefore first lead you through some of the hierarchical restructuring of our own thinking which was occasioned by each of those articles. In doing so we will also make use of the five areas that we suggested you use.

We offered the overview of the cross-sectional story of early career development because it is one of the more exact indications of what we can expect in the way of career and occupational development at the present time. As indicated, the National Assessment of Educational Progress (NAEP) defines the national population it samples and then constructs a scientific sample of that population. The sample is tested so that every person tested does not complete all of the exercises which in their totality define the universe of tested behavior. The result is that we secure a very clear idea of which behaviors exist in what proportion at four ages in our population. But we cannot reason with these data as we are accustomed to do in psychology, namely as the scores of individuals on various scales of individual differences. The NAEP data do not indicate how much career behavior any person has in the United States although they do make it possible to estimate what proportion of people in the United States will exhibit each piece of career behavior.

The NAEP study in addition to being of interest because of its national scope and different methodology also provides an extremely interesting guide to the possible development of occupational behavior in a few of those capacities which are transferred to career development. The rudimentary look at early career development which the NAEP exercises afford suggest that considerable work exists for vocational educators and counselors in facilitating the evolution of career thinking and making during human development. Counselors are not attributed much presence in the development of career behavior by those tested in 1973-74 by the NAEP. As a result, little personal responsibility and capacity for career has developed by seventeen to say nothing of the adult years from 26-35 as well. In general, it appears that the American people may well have basic existential career literacy but that they remain essentially seedlings in the groves of career development.

Project TALENT offers another scientifically constructed sample of the adolescent population in the United States in 1960. The subsequent follow-up of subjects tested in 1960 provides unusual opportunity to secure predictive information on the instruments used in the Project TALENT testing phase. In addition, the later initiation of the National Longitudinal Study of the High School Class (NLSHSC) of 1972 provides another national sample which is also being followed up in reasonable similarity to Project TALENT's design. The dual use of these two studies as in the design of the Transition to Work Simulator (Conroy, 1977), alleviates a major problem of Project TALENT despite its size and representatives. In Project TALENT alone its subjects mature but its predictive data remain of their era, not of today's era. When the data of Project TALENT and of the NLSHSC of 1972 are used harmoniously, we can isolate some of the era differences which exist in career behavior as well as gain more stable estimates of the career consequences of various kinds of adolescent interests and achievements.

Within the Project TALENT design it proved possible to compare the career stabilities evident in the Flanagan, Holland and Roe systems of occupational classification. Since those systems have 12, six and eight occupational categories respectively, a method had to be derived which discounted variability due to different chances for it to happen as the proportions of persons who remained in the same occupational category from the beginning to the ending period were determined and compared. Interestingly, category-equalized career stability proved to be about the same in all three classification systems but, not surprisingly, decreased in all three systems as the interval over which the stability was measured increased. Also, not surprisingly, career stability increased as the base for its measurement was taken at the young adult age rather than the adolescent age. Patterns of change mildly conformed to the circular patterns claimed by Holland and Roe and the linear pattern which the authors hypothesized for the Flanagan system. Interestingly, "career" flow was generally away from intellectual careers to careers in business and sales but each system had unique results as well.

During 1973-74, the National Institute of Education let a contract to the American Institutes for Research to review the literature on career decision making and to propose research that needed doing on the topic (for report see Mitchell, Jones, & Krumboltz, 1979). The paper on social learning theory in career selection by Krumboltz, Mitchell, and Jones (1976) was a major outcome of that work.

The paper is included among our pebbles because it marks a part of the change from the domination of career development theory by the paradigm of choice and the introduction into career development theory of a paradigm of decisions. Furthermore, the paper also illustrates the care with which one proceeds in the evolution of a theory. In theorizing, terms and relationships must be given an explicitness and crispness which make them readily communicable and usable but the care given to these conditions by Krumboltz, Jones and Mitchell is unusual in the construction of career development theory to date.

Notice once again the structure of this paper. A statement of the problem is followed by specification of factors that influence the nature of career decision making. Included are genetic endowment and special abilities, environmental conditions and events, learning experiences including instrumental and associative and task approach skills. The next section postulates explicit interactions among the previously specified influencers of career selections. Specified among the interactive effects are self-observation generalizations, task approach skills, and actions. These specified interactions are then followed by descriptions of the process of career planning and development. The process is specified in general and illustrated in several cases. Theoretical propositions and illustrative hypotheses then follow. Propositions and hypotheses are formulated in terms of influences upon preferences, career decision making skills, and entry behaviors. In each case propositions are offered about both positive and negative influences. The paper concludes with statements of several implications for counselors and clients.

This paper illustrates the value which keeping a fairly strict learning orientation offers to the formulation of testable hypotheses about aspects of career decision making. The paper also holds promise for articulation with an expanding theory of personal implication in career decision making because it holds open the possibility both for instrumental learning and self-observation generalizations. However, in these regards the theory does not go far beyond the postulated dependence of occupational behavior in the interaction of self concept and action which Super introduced into the field in 1953. The present theory does indicate how these influences figure in career choice more explicitly than earlier but the theory is still primarily a career choice theory, not a career decision making theory despite its use of career decision making as one of its primary terms. You need only compare the definition of "decision" proferred in the article, ". . . the selection of an option from among two or more alternatives . . ." (p. 71) with that offered for "choice" in *Webster's Third New International Dictionary* to see this fact. Should you care to contrast the paper's definition with that of "decision" offered in that same dictionary, we feel you would concede our point.

Our point brings us to the fourth and final pebble we have cast into the calm pool of career development theory in order to examine their ripples. Kass, Moreland, Harren and Tinsley (1979) pioneer use of cross-lagged panel comparisons in their included study of career development. Causal inference is slowly creeping into psychology but it hasn't been used too frequently in career psychology. Causal inference is riskier than non-causal inference. You can set yourself up for great falls by use of faulty inference which can easily result from the false positives which slip through causal inference just as they do through non-causal inference, only more so because of the burden of extended modeling assumed in causal inferences. However, the gain you achieve in having causes under control rather than just correlates is well worth the risk and we should undertake that risk more often. Perhaps if we did so we could hasten the emergence of career psychology into greater benefit in the construction of career development interventions. We must know why and how things work, not just that they work. As we know why and how things work, we are able to put them to our use, not just to be creatures of various effects and "learnings."

Harren and his associates have given Tiedeman several surprises relative to Tiedeman's thought since Harren's initial work on it in 1966. In 1963, Tiedeman and O'Hara published *Career Development: Choice and Adjustment*. This monograph was written conjointly with the writing of *Career Development: Self Concept Theory* by Super, Starishevsky, Matlin, and Jordaan (1963). Professors Borow, Jordaan, O'Hara, Super, Tiedeman and Volsky had the opportunity to join in seminar during 1962-63 to outline the state of career development theory for each other and to prepare monographs which summarized their work and pointed to directions each considered important. Tiedeman and O'Hara elected to write within Super's assumptions about the development of the vocation within the career but to highlight that development as identity development of relevance to career and to emphasize the *cyclic* nature of decision making which takes place in the life in the personal unfoldment of the career. Tiedeman and O'Hara were aware that they determined a structure in how they wrote but they elected to call their general conception a language rather than a theory. They did so to stress their feeling that they had defined necessary elements and interrelationships but had done nothing to define what the behavioral outcomes might be.

Because Tiedeman and O'Hara specified only a language and not a behavioral theory, they were surprised in 1966 when Harren published a paper in which he had derived a behavioral measure for development of two of the career decisions which were predicated by Tiedeman and O'Hara and demonstrated developmental differences in these decisions among the college students whom he studied. The fourth pebble we have cast into the calm pond of today's career development theory similarly surprises Tiedeman. Notice that Harren and his colleagues bring the results of this present investigation to bear on the difference in paradigms adopted by Super, Starishevsky, Matlin, and Jordaan in their 1963 monograph and that adopted by Tiedeman and O'Hara in theirs. Harren and his colleagues find support for the reciprocal, bidirectional, person-environment interactions which Tiedeman and O'Hara were trying to introduce into the theory of career development in 1963 rather than for the crystallization of the self concept as prime cause in career development as Super and colleagues assumed. This is the first evidence for some of the cyclic assumptions of the

Tiedeman and O'Hara monograph which have come to Tiedeman's attention. Although the results are those of a single instance, they nevertheless suggest that the more open system considerations of cyclic decisional processes are more essential in career development theory than the deep structure of career development theory so far incorporates. That is the integrating theme of this review, one which will be pursued more fully following upon a few more comments on the included work of Harren and his colleagues.

As you read the paper of Harren and his colleagues imagine some of the joys and agonies of research investigators. The paper references Harren's *Assessment of Career Decision Making* (1976) instrument. That instrument is a refined version of an instrument with which Harren began to experiment in 1966 when he first tested the Tiedeman and O'Hara proposition about the development of career decision making in cycles. At the present time Harren has both broadened this instrument to include information on decision making style as well as information on the accommodation of the college choice which is one of the three structurally defined career decisions in action during college attendance. The other two are selection of a major and selection of an occupation, the first of which presumably goes through the several stages of career decision making associated with both anticipation and accommodation and the second of which continues in the stages of anticipation while in college. Harren and associates have done a great deal of work with this instrument and have presently devised a theory of career decision making during the college years (Harren, 1978) which has gone far beyond its origins in the work of Tiedeman and O'Hara. At the present time, Harren has pretty well carved out his own theory of the specific processes of career development which are likely to transpire during college attendance.

But all is not joy in research. Note in the paper by Harren and colleagues that they refer to prior publication of a paper by Harren, Kass, Tinsley, and Moreland (1978). In that paper, the authors used path analysis presuming a model of causality in which it was assumed that sex-role attitudes influenced cognitive styles. Notice that they write on page 15 of the included study that "two of the three significant comparisons involving sex-role and cognitive measures suggest a direction of causal influence which is opposite to that posited in our earlier work." This finding is not unusual in the scientific pursuit of generalities free of contradictions. They seem to crop up more frequently in the hazardous ground of causal analysis in which Harren and his colleagues presently work than they do in the ground of correlation in which earlier career theorists worked. But we should not let that fact deter us from efforts to understand at more fundamental levels. Instead we should remember that the results of the included study are based on a broader model and more inductive study than was the former one. We should also remember that the results which Harren and his colleagues report in the present study are not much more numerous than those that can be anticipated by chance in the overall. Neither are they too consistent from college year to a next college year. But uncertainty is what makes science so interesting; uncertainty challenges exploration and resolution. It takes only one significant thing to set off a potentially long list of discoveries and you can never be certain whether that which proves significant in one case is a false positive or something of real worth. You've just got to keep inquiring of the environment and doing your best to make sense of what it tells you from your inquiries.

### Rocked in, or Rocking, the Cradle of the Deep?

We argue that career research is presently rocked in the cradle of the deep structure of career development theory. That deep structure hasn't changed much in two decades. In this review we cast a few pebbles into the pond of that deep structure of career development theory in order to see if we can rock the present structure of career development theory in your mind or not. We do so in this concluding sub-section of trying to coordinate the ripples of the four pebbles we have cast into the pond of the present deep structure of theory in career development into a harmonic wave which will help you realize the value of basing our career development theory in a decision rather than a choice paradigm as it is at present.

A simple choice? Not unless you choose rather than decide. To decide you must choose to do so and then you must reciprocally choose within that choice in order to decide the matter you have chosen to consider. That step will advance your participation in what you believe and do based on a stage which Tiedeman and Miller-Tiedeman (1975) call that of choosing in order to decide. To complete the process of deciding by becoming fully involved in the decision, you must finally complete the cycle by engaging in the mirror image of the stage of choosing in order to decide, namely the stage of deciding in order to choose. When you master in this six-stage process in relation to your career — the series of choices our society and you subsume in your life — it seems reasonable to us that you have gained "I" power, or career maturity if you feel safer rocked in career theory's current cradle, not to rock that cradle as we attempt to do in this sub-section. Our purpose in this review, particularly in this sub-section of it, is to argue that this principal driving mechanism of personal integrity in career, "I" power, must be rocked into the current deep cradle structure of career.

We have first been inclusive in this review so that you can see both the stabilization of the deep structure of career development theory and some of the current themes which cry for reorganization of the paradigm upon which the deep structure of our current beliefs about career development rest. We have sought to be as explicit as we can be in the restricted space at our disposal so that the reader can judge the bases of our conclusions. However, in this regard, space allocation forced a briefness which required presumption of prior knowledge of the deep structure of theory in career development. In such instances we have provided references which interested readers can pursue in checking out our statements and conclusions. But for all that, we deliberately cast illustrative pebbles into the calm pond of the deep structure of career development theory picked both to illustrate some well done and interesting research and to make a point for the present need to switch the paradigm underlying study of career development from that of choice to that of decision. And this is where we now take up consideration of those studies both to establish that there is a distinction in the two paradigms to which we point and that that distinction makes a difference in what we are likely to discover about career development were we to use decision rather than choice as basis for thinking in formulation of career development theory.

What is this distinction between choice and decision processes which we consider central to the reformulation of career development theory on terms of decision making rather than of occupational choices?

In discussing the included paper by Krumboltz, Mitchell, and Jones we indicated that the paper was initially prepared as the discussion document for an advisory panel, the members of which were asked to comment upon the social learning theory of career decision making and to suggest research in career decision making which ought to be undertaken on its terms. Tiedeman and Miller-Tiedeman were a part of the advisory panel and submitted a position paper which they entitled "Choice and Decision Processes and Careers" (1975). In this paper, Tiedeman and Miller-Tiedeman use common definitions to the effect that a choice is a preference among alternatives and that a decision is a set adopted in action dictated by choice. In that lexicon, there are processes related to (1) choosing, (2) deciding, (3) choosing to decide, (4) deciding to choose, (5) choosing in order to decide, and (6) deciding in order to choose, all of which have specific meaning in the subject of decisions which lack meaning in the subject of choice. We illustrated those differences in introducing you in this sub-section to your choice of paradigms for future work in career development theory. These are the grounds which have led us to argue that the paradigm of decision is the more fundamental paradigm on which we should base the study of career development in preference to the paradigm of choice on which the present deep structure of the theory is based.

Tiedeman and numerous colleagues reached this conclusion in a long series of work which provides a number of explicit bases on which we can rapidly ground career development theory in decision making rather than in choice if inclined to do so. We summarize that work here in order to make a work basis available to readers inclined towards concerted attack on decision making as driving force in career development.

Tiedeman marks his initial insight into the distinction between choice and decision with development of the book, *Multivariate Statistics for Personnel Classification* which Rulon, Tiedeman, Tatsuoka and Langmuir (1976) wrote. That book presents the explicit context within which we designate decision rules for predicting group membership from test data on persons whose later group membership is not known when predicting. The rules are derived in a Cartesian space supposedly spanning the test scores of similar individuals whose later group memberships are known when defining the rules. Although Holland and Roe arrived at their occupational classification systems by employing different logic, since both claim that their systems are essentially circular in nature, both really operate in terms of circular segmentation of the two discriminant functions offered by the observations leading to the occupational classification of each subject. However, Holland and Roe — and Tiedeman in his beginnings — were particularly fascinated by the prediction of the occupational choice which a person would make. This is an initial aspect of career development but not the whole aspect. This initial aspect establishes a structure of roles and potential need satisfaction but it does not get into personal decision making processes.

Tiedeman began moving to choos*ing*, rather than choice, as basis for career development as he came into association with Donald Super, Robert O'Hara and others who made him aware of self conceptions as grounds for the time occupations of persons. In a self concept origin of occupational choice, it is as if self conceptions seize one and force occupancy of one's time for their satisfaction. Tiedeman and O'Hara essentially accepted Donald Super's view in this matter during 1962-63 while Super and Jean Jordaan were at work with Starishevsky and Matlin in the elaboration of their self concept based conceptions of career development. However, Tiedeman and O'Hara elected to conceive career development within the theory of identity development and realized that they had to provide for the process of choos*ing* in doing so by placing the chosen area for time occupancy within the presumed development of a decision, a choice forged in the potential steps of exploration, crystallization, choice, and clarification during its anticipation and in the potential steps of induction, reformation, and integration in its accommodation during implementation. Choos*ing* and decid*ing* were therefore both included in this conception of *cyclic* differentiation and integration which Tiedeman and O'Hara introduced as mechanisms in career development.

Two career development issues converged in Tiedeman's thinking during the decade following publication of *Career Development: Choice and Adjustment* (1963) with O'Hara. On the one hand, Tiedeman and a large group of colleagues were given a three-year opportunity to design an interreactive computer environment in which the curious could repeatedly inquire in relation to matters of schooling, occupation, military service, and personal and family living. Tiedeman and his colleagues worked out a design in which the data files containing the facts relevant to a wide variety of questions in one or more of the four areas of basic life decision could be queried in ways intended to arouse and to perfect the inquirer's understanding of comprehension, the dividing in order to combine and combining in order to divide — and simultaneously — which is characteristic of getting to know when you assume responsibility for what you presumably then know. Tiedeman has a book on this design in press. It will be published as *Career Development: Designing Our Career Machines* in the near future. This work essentially continued the work on developing the sense of personal presence in one's career which Kehas (1977) and Field (1977) had initiated in Tiedeman's thought. In the meantime, Katz (1974) with his SIGI (System for Interactive Guidance and Instruction) and Harris-Bowlsbey (1976) with her Discover system have both put aspects of this basic design into current operation. Katz emphasizes valuing as a point of entry to career development consciousness; Harris-Bowlsbey emphasizes decision making. Katz has made excellent use of the prosthesis to the mind which an interactive computer system can be when apprpriately programmed both to derive a decision making simulation which can be used as a test of progress in decision making development (Katz, 1975), and to study sex differences in the actual processes of decision making encoded in SIGI as inquirers specified their values and made their occupational choices under system guidance to be consistent in the occupational expression of elected values or to change the values (Norris, Katz & Chapman, 1978).

At the same time as Tiedeman was at work on the relationship which he considered necessary to develop in order to make a computer system interactively prosthetic to the mind during times of choice as one worked to perfect personal command of one's decision making developments, Gordon Dudley worked with him to make him conscious of the mind processes involved in mastery of the relationship of structure and function in the construction of the self as career. Dudley and Tiedeman published their work and that of several colleagues on this issue in *Career Development: Exploration and Commitment* (1977). Within the duality of structure and function it becomes possible to grasp the concept of hierarchization which becomes possible during differentiation and integration of one's conceptual system. For instance, you will have to differentiate your understanding of the present deep structure of career development theory if you are to reintegrate it into the concept of decision rather than of choice as we contend it presently is.

While Tiedeman was reintegrating into his conceptualization of career development the described mind prothesis relation of ISVD and the concept hierarchization in structure-function development during creativity, John Peatling advanced a group theory of personality reconstructionism to him. Together Peatling and Tiedeman then transformed Ligon's (1970) original group model of personality reconstructionism into an Abelian group which at its fifth level of differentiation contained sixteen elements. They also fashioned these elements into a hierarchy within which it became possible to hypothesize development through four differentiations from the unitary state of personality to the sixteen element state of self constructionism. The model for the Abelian group of 16 elements unfolds from multiplication of the polynomial (I + a) (I + b) (I + c) (I + d) where I is the identity element, uniqueness; a is the first generator element, endowments; b the second, self-image; c the third, action; and d the fourth, decision making. It is interesting to array the levels of the Peatling and Tiedeman model against the first five levels of Erikson's (1959) model of psycho-social identity development. Tiedeman feels that the Peatling and Tiedeman model corresponds at these levels and awaits additional research which will differentiate the missing three levels during the adult years but Peatling is of persuasion that the fifth level of the model corresponds with Erikson's eighth level, integrity, and that several of Erikson's stages are subsumed in one or more of the intermediate levels of the Peatling and Tiedeman model. As Tiedeman became more tutored in Peatling's original group model of personality constructionism, he succeeded in drawing Peatling's attention to the heuristics available in the exercise of designing a machine which will let you relate to the known so that you can experience the process of getting to know while leaving a record for yourself of how you did so. The two therefore wrote *Career Development: Designing Self* (1977) which turned the group model of personality reconstructionism into an ISVD-like relationship for life, not just occupational, decisions which became their self constructionist group model of personality reconstructionism. This is just a more exact way to refer to those processes which are involved in your getting to comprehend what was known by another so that you understand and use it and eventually comprehend both the object of the understanding and the process of comprehending itself.

During the past eight years, Anna Miller-Tiedeman has profoundly influenced Tiedeman's thought on the mastery of career decision making as the object of career development. The two met because both were interested in career decision making, Miller-Tiedeman in teaching it in secondary school and Tiedeman in understanding it in career development. Miller-Tiedeman has had initiative in further differentiating Tiedeman's thought with regard to the centering of the self in one's decision making development. She started statement of that process in a 1972 paper (Miller & Tiedeman, 1972) in which both of them derived a model of decision making development which had to be mastered in moving to comprehension of thought development. Miller-Tiedeman later constructed a simplified pyramidal model cut along the principal diagonal of their original cubistic model and made this the basis of efforts to bring its structure into the comprehension of secondary school students. She reports her work on this problem in a forthcoming book with Tiedeman which they entitle *Career Development: Journey into "I" Power* (Miller-Tiedeman and Tiedeman, in press). This book deals with the cooperation with the evolution of humanity it is possible to empower personally by taking responsibility for one's life during one's development as a being. Miller-Tiedeman and Tiedeman dub this empowerment, "I" power. Comprehension of decision making development is the prime mechanism of "I" power.

In her work with middle and secondary school systems, Miller-Tiedeman has discovered that frequently learners have to grow into full use of the seven stage Tiedeman and O'Hara paradigm of decision making outlined above. Learners don't naturally use it although everyone is theoretically capable of it. In her experience, Miller-Tiedeman has found that learners' comprehension of the Tiedeman and O'Hara paradigm of decision making ordinarily expands in the following way:

| *Level* | *Anticipation* | *Accommodation* |
|---|---|---|
| 1 | Choice | Reformation |
| 2 | Choice/Clarification | Reformation |

| | | |
|---|---|---|
| 3 | Crystallization/Choice/ Clarification | Induction/Reformation |
| 4 | Exploration/Crystallization/ Choice/Clarification | Induction/Reformation/ Integration |

As Miller-Tiedeman wrestled with the problem of how to help adolescents empower thought in their daily actions, particularly their daily actions relevant to progressing towards a tentative occupational choice, she started to teach her pyramidal model as necessary to mastery of career constructionism in expectation that learners would generalize that which they then know to that which they are then doing, that is to act as if the necessary is sufficient. Although Miller-Tiedeman (with Tiedeman, in press) achieved some acquisition by learners of that which is known to her, she began to discern that generalization of the necessary into belief of its sufficiency required a strategy in which the necessary in deciding is taught during times when the sufficiency of decision in life is imminent, not otherwise as she had been doing. When learners are suffering crises in existential choice they are much more amenable to comprehend the value which mastery of the decision process offers them than at other times. At other times, decision making is tiresome, not powerful, at least for adolescents. In her revised strategy for moving students from the necessary level of dealing with choosing and deciding to a level where they are personally putting that necessary and other-specified framework into the sufficient one of choosing to decide and deciding to choose, Miller-Tiedeman has found that adolescents in secondary school only infrequently move very far in their comprehension of comprehending, that is in their comprehension of the logical problem of choosing in order to decide and deciding in order to choose. It appears that the cognitive structure — of doing correctly, understanding, and comprehending creatively in acting as if one knows — has a time-extended life of considerable duration, a duration which is only slightly co-extensive with the cognitive development ordinarily transpiring in the adolescent years coinciding with secondary school attendance. Miller-Tiedeman (with Tiedeman, in press) has achieved statistically significant gains in ego development in her direct-instruction strategy but she has found those gains at a relatively low level on the Loevinger (1976) ego development scale. In addition, that small gain is achieved at sufficiently high psychological cost to the instructor to have caused her to modify her strategy as reported above.

So much then for available resources on career decision making development. Now back to the major question of this sub-section, namely, will you in the future ground research in career development theory in a decision making paradigm or continue to pursue the topic only in terms of an occupational choice paradigm?

Our discussion has so far made the points that the contract which the National Institute of Education initiated with the American Institutes of Research in 1974-75 started in process of introducing social learning theory into career decision making by Krumboltz, Mitchell and Jones and that the concepts of career decision making had been under development by at least one investigator and his colleagues for about the previous two decades. We have also noted that the Krumboltz, Mitchell and Jones model offers both instrumental learning and self-observation generalizations as places within which the theory of self-constructed career development being built by Tiedeman and his colleagues can find union. If you attempt to create a union of the social learning theory of career selection with the paradigms of career decision making under development by Tiedeman and his colleagues, you will have to decide two things. First, will you admit completely individually generated knowledge as learned material? The models with which Tiedeman and his colleagues work not alone include this form of knowledge, they give major emphasis to it as the expansion of personal perception in a reality in which the learner does not detect or project deceit. Second, to what bottom line dimension would you have personal and communal knowledge sum in your model? In the models with which Tiedeman and Miller-Tiedeman work in the personal revelation of "I" power to individuals with whom they work or whom they study, they sum to the bottom line dimension of personal comprehension of existential movement towards aloneness with personal control of bearable levels of ensuing loneliness (Tiedeman, 1979). It is not clear to the authors to what bottom line Krumboltz, Mitchell, and Jones suggest that their social learning theory may be used. It appears that the model is intended to be largely heuristic although it can be used as suggested in its Section E to influence behavior in certain of its fields.

It may appear that the distinction we just made is one without a difference. However, it is failure to make a similar distinction in the grounding of career development theory in the paradigm of choice or decision which makes a great difference in what we discuss in convention and in whether we try to change the deep structure of career development theory or not. For instance, consider two symposiums on career decision making which were offered at the convention of the American Personnel and Guidance Association meeting in Las Vegas, Nevada, from 31 March to 5 April 1979. Symposium A was constituted as follows:

Is Career Decision-Making Career Maturity? The Models, the Measures, and the Data

- "A Career Decision-Making Model" By Vincent A. Harren
- "Is Career Decision Making Career Maturity? A Developmental Perspective" by Donald E. Super
- "Career Decision Making Measures in the Context of Harren's Model" by Dale J. Prediger
- "Career Decision Making and Career Maturity: How Much Overlap?" by Samuel H. Osipow
- "The Validity of the Crites Model of Career Maturity with Ninth-Grade Students" by Bert W. Westbrook

Symposium B was constituted as follows:

Toward Assessing Developmental Change in Educational Settings

- "Assessing Career Decision Processes as Developmental Change" by David A Jepsen

306

"Measuring Career Maturity in High School Females" by Joan Daniels Pedro

"Quantitative Indices of Qualitative Change: Assessing Moral Development in Medical Education" by H. Harry Daniels

"An Application of Formative Research in Psychological Education" by Herbert A. Exum

Symposiums A and B were as different as night from day. Symposium A was primarily offered to address the question, Is Career Decision Making Career Maturity? Vincent Harren first spoke of career decision making. However, because it dealt with measures and data more than with models, the symposium emerged so that its concept of career decision making was mostly limited to investigation of its behavioral manifestation, not to consideration of its logical structure. As a result, instead of straightforwardly answering, "No," to the symposium's structuring question and getting on with identification of the distinctions between career decision making and career maturity, as defined from an occupational choice paradigm, Donald Super struggled in the Symposium to map both concepts into a single space primarily defined by his conceptions of behaviors manifestations of choice-derived career maturity as in the following table:

**Current Models of Career Maturity and Decision-Making**

| *Career Maturity* | | *Career Decision Making* | |
|---|---|---|---|
| *Super-NICEC* | *Crites* | *Harren* | *Arroba's Styles* |
| *I Autonomy* | *I Attitudes* | *I Awareness* | |
| Independent Decision Making | Independence | A. Dependence | Compliance |
| Internal Control | Conception | | |
| Acceptance of Responsibility | | | |
| *II Planfulness* | | | |
| Present | Involvement | | Thoughtlessness |
| Intermediate | Orientation | | Hesitation |
| Distant Future | Preference | | Emotion |
| *III Exploration* | | | |
| Querying | | | |
| Resources | | | |
| Participation | | | |
| *IV Information* | *II Competencies* | | |
| World of Work | Information | | |
| Preferred Occupation | | | |

| | | | |
|---|---|---|---|
| *V Decision Making* | | | |
| Principles | Problem Solving | B. Reason | Logic |
| Practice | | C. Intuition | |
| *VI Reality Orientation* | | | |
| Crystallization | Goal Selection | | |
| Consistency | Consistency | | |
| Work Experience | | | |
| Self Knowledge | Self Appraisal | | |
| Self-Situation Realism | Realism | | |
| Plans | Planning | *II Planning* | |
| | | *III Commitment* | |
| | | *IV Implementation* (outcomes) | |
| | | 1 Identity | |
| | | 2 Self Esteem | |

---

*Note.* From "Is Career Decision Making Career Maturity? A Developmental Perspective" by D. E. Super.

*Note.* In Harren's college model Roman numerals here denote Process, Capitals denote Style Characteristics, arabics Self-Concept Characteristics; his developmental 'Tasks' and 'Conditions', being societal rather than personal, are omitted here.

The table itself should have been sufficient indication that career decision making is not occupational choice derived career maturity. Had it been taken that way, the paper could have avoided its implicit message that career maturity is presently more behaviorally defined (see Jordaan & Heyde, 1979 for example) than is career decision making and that the concepts of career decision making have to project into a space common with the space of career maturity. This is fine if we are to understand career decision making as subordinate to career maturity, not the reverse. It does not entertain the possibility either that the two are best conceived independently with neither system considered subordinate to the other or that career maturity might best be conceived as subordinate to career decision making rather than the reverse as tabled. Actually, in the personal understanding of career decision making with which Tiedeman and Miller-Tiedeman are presently concerned, career maturity is more related to Loevinger's ego development concept or to the comprehension of comprehending which Miller-Tiedeman and Tiedeman presently use as bottom line for their work in "I" power. In that framework, Super's, Prediger's and Osipow's papers suggest the depth to which movement towards aloneness with acceptable personal levels of loneliness has progressed in its choice maturation manifestations within the career.

The measures and the data considered in the symposium were:

The Assessment of Career Decision Making of Vincent A. Harren

The Career Maturity Inventory of John O. Crites
The Career Development Inventory of Donald E. Super
The Career Decision Scale of Samuel H. Osipow, Clarke G. Carney, Jane Winer, Barbara Yanico, and Maryanna Koschier

The symposium papers in their entirety both second the presence and slow growth of vocationally related behavior in the first thirty years of life as revealed by the National Assessment of Educational Progress data included as the first study in the prior Section and reveal the small amount of common variance between measures of career decision making and of career maturity during those years. It appears that career decision making and career maturity are not alone logically different; career decision making drives choice-defined career maturation in only small measure during at least early career development.

Symposium B is built on a possible assumption, that decisions develop, not on the impossible assumption that decision making and choice-derived maturation are the same. The set of papers therefore make more sense in their entirety than do those of Symposium A.

Jepsen and Dilley (1974) have a stellar review of career decision making which established them as scholars in the topic. Jepsen launched studies of decision processes in secondary school students from this beginning. His paper not alone sets the stage for development in the decision process it also sets the stage for the symposium's investigation of the assumption of prerequisite staging in career development which is a primary question of development. In addition, Jepsen summarizes some of the findings he and his colleagues have unearthed as they have worked with adolescents in making them aware of decision processes which go on within their minds.

Pedro followed Jepsen's presentation. Pedro is interested in the fact of femaleness and of culture in career development theory. She rightly points out the dependence of the present deep structure of career development theory upon the events in the lives of white males in our society and upon a kind of "white male club" mentality. She also makes interesting suggestions about events in the lives of females and minority group members and in their thinking which cry for incorporation into a more comprehensive and general career development theory which we hope begins to emerge. She describes two scales she has defined to begin such incorporation. We believe that the empowerment of self constructionism through developed comprehension of career decision making development can serve as grounds for such a more comprehensive and general theory.

Daniels' paper discusses the major question about development, whether it is staged or not. He does so in terms of Kohlberg's theory of moral development which is a staged theory of development and of Rest's, which is not. Within the limited range of moral development which he investigated during the short period of only three semesters of a medical education, it appears that Rest's quantitative format was more sensitive to short-term longitudinal changes than was Kohlberg's staged theory of development.

Exum's contribution to the symposium on the assessment of developmental changes in educational settings dealt with the development and formative evaluation of an undergraduate peer helping program. "The results of the study indicated that the final peer helping program, designed through the action/reflection methodology of formative research, was able to facilitate increases in ego development as measured by the Loevinger Sentence Completion form" (Exum, 1979, abstract). In this regard, Exum's results parallel the more extensive investigations on the teaching of moral development through psychological education which are summarized by Mosher and Sprinthall (1978). The gains in ego development also parallel those in the Loevinger ego development scale which have already been presented in discussing Miller-Tiedeman's work in the teaching of decision making in secondary school. It appears that ego development actually does develop and that decision making (formative evaluation) and instruction in moral development are some of the means by which its staged advances can be facilitated.

We conclude this discourse on ripples in the currently calm pond of the deep structure of career development theory with a bad pun. With all of us it's now think or spin — in the pond of the deep structure of career development theory. On the one hand, we must individually be scientists at heart and think in our career or let career development happen and ceaselessly spin in the occupational roles others make for us for the rest of our lives. For either you shape the role or the role shapes you.

Erich Fromm (1947) defines ethics as the applied science of the art of living. For us, career plays the role of ethics in Fromm's construction. By substituting decision for choice in the deep structure of career development theory we succeed in making the personal career the applied science of the art of living. The applied science is to know the necessary, to comprehend the sufficient, and to comprehend comprehension as cooperation with evolution in the now of our life career developments.

## SYNTHESIS REFERENCES

Conroy, W. G., Jr. *An introduction to transition to work simulator.* Lowell, Mass.: College of Management Science, University of Lowell, 1977.

Dudley, G. A., & Tiedeman, D. V. *Career development: Exploration and commitment.* Muncie, Ind.: Accelerated Development, 1977.

Erikson, E. H. *Identity and the life cycle: Selected papers.* New York: International Universities Press, 1959.

Exum, H. A. *An application of formative research in psychological education.* Iowa City: University of Iowa, 1979. (Abstract)

Field, F. L., Jr. Purposeful behavior. In G. A. Dudley & D. V. Tiedeman (Eds.), *Career development: Exploration and commitment.* Muncie, Ind.: Accelerated Development, 1977.

Fromm, E. *Man for himself.* New York: Rinehart & Company, Inc., 1947.

Harren, V. A. The vocational decision-making process among college males. *Journal of Counseling Psychology,* 1966, *13,* 271-277.

Harren, V. A. *Assessment of career decision making (form B).* Carbondale: Southern Illinois University, 1976. (Multilith)

Harren, V. A. *A model of career decision making for college students.* Carbondale: Southern Illinois University, 1978. (Multilith) *(Journal of Vocational Behavior,* in press.)

Harren, V. A., Kass, R. A., Tinsley, H. E. A., & Moreland, J. R. Influence of sex role attitudes and cognitive styles on career decision making. *Journal of Counseling Psychology,* 1978, *25,* 390-398.

Harris-Bowlsbey, J. *Discover: A computer-based career guidance and counselor-administrative support system.* Westminster: The Discover Foundation, Western Maryland College, 1976.

Jepsen, D. A., & Dilley, J. S. Vocational decision-making models: a review and comparative analysis. *Review of Educational Research,* 1974, *44,* 331-344.

Jordaan, J. P., & Heyde, M. B. *Vocational maturity during the high school years.* New York: Teachers College Press, 1979.

Kass, R. A., Moreland, J. R., Harren, V. A., & Tinsley, H. E. A. *Causal inference among variables related to career decision making: The chicken or the egg?* Carbondale: Southern Illinois University, 1979. (Multilith)

Katz, M. R. Career decision-making: A computer-based system of interactive guidance and information (SIGI). *Proceedings of the 1973 Invitational Conference on Testing Problems.* Princeton, N.J.: Educational Testing Service, 1974, pp. 43-69.

Katz, M. R. Assessment of career decision-making: Process and outcome. In A. M. Mitchell, W. R. Unruh & G. B. Jones (Eds.), *Technical report of a conference on career decision making.* Palo Alto, Calif.: American Institutes for Research, 1975, pp. 149-177.

Kehas, C. D. The self-concept: A critical analysis. In G. A. Dudley & D. V. Tiedeman (Eds.), *Career development: Exploration and commitment.* Muncie, Ind.: Accelerated Development, 1977, pp. 33-58.

Krumboltz, J. D., Mitchell, A. M., & Jones, G. B. A social learning theory of career selection. *The Counseling Psychologist,* 1976, *6*(1), 71-81.

Ligon, E. M. A map for character development: Mathematical group theory. *Character Potential: A Record of Research,* 1970, *5*(1&2).

Loevinger, J. *Ego development.* San Francisco: Jossey-Bass, 1976.

Miller, A. L., & Tiedeman, D. V. Decision making for the 70's: The cubing of the Tiedeman paradigm and its application in career education. *Focus on Guidance,* 1972, *5,* 1-15.

Miller-Tiedeman, A., & Tiedeman, D. V. *Career development: Journey* into "I" power. Schenectady, N.Y.: Character Research Press, in press.

Mitchell, A. M., Jones, G. B., & Krumboltz, J. D. *Social learning and career decision making.* Cranston, R.I.: Carroll Press, 1979.

Mosher, R. L., & Sprinthall, N. A. *Value development . . . As the aim of education.* Schenectady, N.Y.: Character Research Press, 1978.

Norris, L., Katz, M. R., & Chapman, W. *Sex differences in the career decision-making process.* Princeton, N.J.: Educational Testing Service, 1978.

Peatling, J. H., & Tiedeman, D. V. *Career development: Designing self.* Muncie, Ind.: Accelerated Development, 1977.

Rulon, P. J., Tiedeman, D. V., Tatsuoka, M., & Langmuir, C. R. *Multivariate statistics for personnel classification.* New York: Wiley, 1967.

Super, D. E., Starishevsky, R., Matlin, N., & Jordaan, J. P. *Career development: Self concept theory.* New York: College Entrance Examination Board, 1963.

Tiedeman, D. V. *Career development: Designing our career machines.* Schenectady, N.Y.: Character Research Press, in press.

Tiedeman, D. V., & Miller-Tiedeman, A. Choice and decisions processes and careers. In A. M. Mitchell, W. R. Unruh & G. B. Jones (Eds.), *Technical report of a conference on career decision making.* Palo Alto, Calif.: American Institutes for Research, 1975, pp. 60-113.

Tiedeman, D. V., & O'Hara, R. P. *Career development: Choice and adjustment.* New York: College Entrance Examination Board, 1963.

311

# SECTION FIVE

## Research on Employment and Training

---

ROBERT L. McGOUGH and DANIEL E. VOGLER
Virginia Polytechnic Institute
and State University

# Research Review

## INTRODUCTION

The purpose of this section is to provide a descriptive review of recent research relating to employment and training (E&T) programs sponsored by the U.S. Department of Labor. The section co-editors presume that research includes development. Therefore, both research and development activities are considered and discussed. The review has been limited to reflect only those research activities sponored by the Employment and Training Administration of the U.S. Department of Labor (DOL). E&T is the contemporary term and acronym used to denote the U.S. Department of Labor's activities which address the concerns relating to unemployment and underemployment in the labor force. The current legislative authorization for DOL outlines the E&T charge: "To assist the Nation in expanding work opportunities and assuring access to those opportunities for all who desire it . . ." (Public Law 93-203, Title III, Part B, Sec. 311.(a)). The term "Manpower" was used from the early 1960's until 1975 to describe essentially the same activities. In 1975 the DOL designated that the term "Manpower" be changed to "Employment and Training." The recency of the change required that this review treat the terms as synonymous. Funds to support the E&T research and development projects are awarded under authority of several legislative acts: Comprehensive Employment and Training Act (CETA) of 1973 (Title III) (PL 93-203), Social Security Act (81 Stat. 888) (Title IV, pt. C., sec. 441), and their subsequent amendments. It should be noted that the bulk of E&T related research funds flow from the CETA legislation.

The delimitation for this review should not serve to diminish the importance of the broad scope of employment and training research. For in one way or another most research can be linked to employment or training. The U.S. Departments of Agriculture, Commerce, and Defense have regularly initiated and executed research in this area. In addition, these previously mentioned efforts are bolstered by the data collection and quasi-research activities of a host of other governmental units including employment and security commissions, census bureaus, the Social Security Administration, and agencies related to international development and trade. Although data are not available to substantiate the scope, one should also recognize the massive contributions from the private sector. Employment and training research consumers and decision makers should therefore consider the scope and varied context from which E&T research products emanate.

## LITERATURE REVIEW PROCEDURE

The review of employment and training research was initiated with a study of the Department of Labor's document entitled, *Research and Development Projects*. This publication has been issued annually for eight years. It summarizes the projects funded by the Office of Research and Development (ORD) of the Employment and Training Administration (ETA). The 1978 Edition contains all projects active on September 30, 1978 and those completed during the previous three years. Project summaries are provided for projects completed during the previous year. A similar approach was used in the earlier editions of the document. The section co-editors found the document, *Research and Development Projects* to be quite useful in determining the interests, scope, and research technology commonly sponsored by ORD. Each project entry includes the research title, institution of origin, grant/contract number, status of project, and project director. Projects in progress or completed during the past year are described by a two or three paragraph summary and a list of approximately five descriptors. Complete project reports can be obtained from the National Technical Information Service (NTIS), Educational Resource Information Center (ERIC), or Government Printing Office (GPO). Limited copies are available from the ETA or from the institution of origin.

The descriptors from the *Research and Development Projects* document were coupled with an ERIC Thesaurus analysis to identify descriptors for a computer search. An on-line computer assisted search was conducted to identify the scope and character of employment and training R&D literature. A comparison of the two sources revealed similar descriptors. The ERIC search produced journal and periodical reports and a small number of studies conducted outside the sponsorship of the Department of Labor. Naturally, considerable overlap of research reports existed between ERIC and the *Research and Development Projects* document.

The computer search used broad terms, sought availability from all ERIC categories, and addressed documents submitted since the origin of the 1966 data base. The descriptors reflected both E&T and Manpower research activities. In addition, the descriptors used were expanded to include employment, training, and disadvantagement. The latter category was chosen in an attempt to secure representation related to the social aspects of CETA. Table 1 provides an outline of the computer search structure and reports the unduplicated documents by sets. The "print" entries represent the number of unduplicated documents submitted during the past five years. Set 16 was added to insure that all documents within the data base using CETA as a descriptor were identified. The recency of the legislation influence was accented.

## OVERVIEW E&T RESEARCH DOL R&D PROJECTS

The eight additions of *Research and Development Projects* provided a wealth of information about employment and training research. The documents succinctly described the nature of the Department of Labor's priorities. The current priorities include funding in six separate categories and 20 additional subcategories. For the most part, the categories represented organizational areas ranging from operational studies to the analysis of raw employment data.

Although it was not specifically stated one could infer that the research and development thrust was oriented to the addressing of problems perceived by officials of the Department of Labor. Further, there was an absence of evidence to support cooperative employment and training research among agencies or institutions not within the rubric of

314

## TABLE 1
On Line Computer Structure and Numeric Hits for an Employment and Training Search

| Set | Items | Description |
|---|---|---|
| 1 | 524 | Employment Projections |
| 2 | 0 | Underemployment |
| 3 | 503 | Unemployed |
| 4 | 42 | Subemployment |
| 5 | 871 | Unemployment |
| 6 | 1029 | Economic Disadvantagement |
| 7 | 1495 | Economically Disadvantaged |
| 8 | 144 | Underemployed |
| 9 | 4193 | 1-8+ |
| 10 | 2165 | Manpower Development |
| 11 | 1897 | Manpower Needs |
| 12 | 1451 | Manpower Utilization |
| 13 | 625 | Employment Programs |
| 14 | 4911 | 10-13/+ |
| 15 | 835 | 9*14 |
| 16 | 165 | CETA |
| 17 | 118 | 16*14 |
| 18 | 921 | 15 + 17 |
| 19 | 143 | 18/062752-999999/EJ |
| 20 | 309 | 18/080788-999999/ED |
| 21 | 452 | 19 + 20 |
| Print 19/5/1-130 | | |
| Print 20/5/1-250 | | |

DOL. Table 2 outlines the six broad categories and 20 subcategories of DOL E&T research. The 685 active projects within the past three years are detailed by frequency.

The DOL sponsored projects were administered through five separate contract and grant programs. The dominant program included the general R&D projects designed to fund experimental, developmental, demonstration, and research activities. These projects are particularly suitable for contracting vocational education researchers. A broad and flexible format was provided by the Department of Labor. Awards are made to public and private organizations in reaction to a proposal submitted by a prospective awardee. Proposals are reviewed by committees and negotiated by DOL research staff. A grant or contract to the successful contractee is awarded as the result of this process. This general research program provides funding for projects related to the areas of program planning and administration, programs and techniques, the labor market, and enonomic and social policies. These categories are presented in Table 2. No minimum or maximum time limits or fund limits exist for a project funded from this program.

An institutional grant program is also provided for the development of E&T capability at colleges and universities. The program was restructured in 1978 to provide incentives for institutions not previously funded. The current program provides assistance to sixteen institutions with grants planned for a four year period of time. The institutional awards are distributed among the ten regions and provide an additional

### TABLE 2
### Department of Labor R&D Active Projects by Operational Categories
### October 1, 1975-September 30, 1978

| *Categories of Projects* | *Frequency* |
|---|---|
| Program Planning and Administration | |
| CETA Agency Planning | 10 |
| Labor Market & Other Systems | 15 |
| Agency Capabilities | 27 |
| R&D, Evaluation & Planning | 9 |
| | 61 |
| Programs and Techniques | |
| Education | 19 |
| Public Employment Programs | 4 |
| Supported Employment | 3 |
| Training & Apprenticeship | 14 |
| Upgrading & Job Restructuring | 12 |
| Welfare Recipient Programs | 24 |
| Worker Assessment & Orientation | 6 |
| Other Supportive Service for Workers/Trainees | 7 |
| Programs for Other Unemployed | 18 |
| | 107 |
| The Labor Market | |
| Labor Force, Labor Market, Labor Demand — General | 29 |
| Labor Force, Labor Market — Specific Sectors & Cohorts | 75 |
| Employer Practices | 20 |
| Worker Attitudes | 5 |
| | 129 |
| Economic and Social Policies | 24 |
| | 24 |
| Institutional, Dissertation & Small Grant Research Projects | |
| Institutional Grants | 16 |
| Doctoral Dissertation Grants | 220 |
| Small Grant Research Projects | 63 |
| | 299 |
| Foreign Trade and U.S. Investment Abroad | 65 |
| | 65 |

six special awards to institutions with significant minority enrollments. This program is currently funded at an approximate allocation of $2.5 million annually.

A creative doctoral dissertation grants program has been in effect since 1965. This program is designed to attract social science students to employment and training inquiry while generating new knowledge in the area. The current grants must address state and local employment and training agencies' R&D needs. The awardee must submit a proposal and provide evidence that all course work has been completed for the doctorate. The program provides research support and stipends to the awardee. The grant must not exceed $10,000 and is limited to one year.

A small grant research projects program has been designed to suppor established scholars in the conducting of four types of projects. The project types include inquiry in new fields, examination of new approaches from existing disciplines, pilot testing of effectiveness or feasibility, and the synthesis of current state-of-the-art. Historically, this program has often provided a vehicle for subsequent funding of larger R&D projects. Approved proposal emphasis has generally been focused upon the innovative, practical, and policy related characteristics of the research problem(s). A small grant research proposal must not exceed $15,000 for direct costs and is limited to one year with provisions for a one year renewal.

The fourth and final research program of ETA is designed to foster research with an international focus. Research in this area is administered by the Foreign Economic Research Staff or the Bureau of International Labor Affairs (BILA). The research is concentrated on the impact of U.S. foreign trade and investment policies in American labor. No specific time limits or funds limits exist for a project funded in this area.

The computer review contained entries that overlapped the DOL's Research and Development Projects documents. The search identified additional information from journals and periodicals and a very small number of projects funded from outside the DOL. This occurrence supports the recognized dominance of DOL in E&T in this research.

A review of the computer assisted search results, as supported in Table 1, produced several interesting relationships. The most frequently identified descriptor was manpower development. Manpower needs and manpower utilization were also frequently identified. As a contrast the descriptors, employment projections, unemployed, employment programs, and CETA were used less than one third as frequently. There was a total of 165 projects that used CETA as a descriptor.

A review of the journal and periodical representation in the ERIC data bank produced no journal that was dominant in the publication of E&T related research articles. More than 25 journals were used to report activities related to employment and training research and development. The bulk of articles published related to development activities. The extent of research oriented publications for employment and training must be considered virtually non-existent.

## SUMMARY

Employment and training research has been defined to include research and development activities and delimited to exclude those activities outside the egis of the Department of Labor. The projects conducted have been codified by organizational demands. The activities related to functional areas of policy, forecast, evaluation, demonstration, follow-up, and experimental activities. The following articles were chosen to illustrate the above mentioned functional areas of research and development in employment and training (E&T).

# A Description of the National Longitudinal Surveys

HERBERT S. PARNES
and KEZIA SPROAT
The Ohio State University

## STRUCTURE AND DEVELOPMENT OF THE NLS RESEARCH PROJECT

The National Longitudinal Surveys began early in 1965 when the Office of Manpower Policy, Evaluation, and Research of the United States Department of Labor contracted with the Center for Human Resource of The Ohio State University for longitudinal studies of the labor market experience of four groups in the United States population: men 45 to 59 years of age, women 30 to 44 years of age, and young men and women 14 to 24. (For convenience, these groups will hereafter be referred to as "men," "women," "boys," and "girls," respectively.) Under a separate contract with the Labor Department, the Bureau of the Census was to be responsible for the design of the sample, the field work, and data processing.

Since budget constraints precluded a sample of the total population, these four groups were selected because each faces more or less unique labor market problems of special concern to policy makers. For the two cohorts of youth, these problems revolve around the process of occupational choice, and include both the preparation for work and the frequently difficult period of accommodation to the labor market when formal schooling has been completed. The special problems of the middle-aged men stem in part from skill obsolescence, from the increasing incidence of health problems, and from employment discrimination, all of which are reflected in declining labor force participation rates and in longer-than-average duration of unemployment if it occurs. For the women, the special labor market problems are those associated with re-entry into the labor force after an extended absence by married women who feel that their children no longer require their continuous presence at home.

## THE SURVEYS

The initial plan called for annual interviews over a five-year period with representative samples of individuals — six interviews with each cohort. As a result of cost considerations it was decided after the second survey of the men to survey the two older groups biennially rather than annually.[1] The younger groups, because of their greater mobility, were to continue to be interviewed annually. As the five-year period drew to a close, the relatively low attrition rates[2] that had been experienced and the widespread interest that had been generated in the data bases led to the decision to continue the surveys beyond

---

[1] The older cohort of women has interviewed in both 1971 and 1972 in order to permit a survey at the end of the five-year period.

[2] Although at the outset of the study it was feared that attrition would be a major problem, shrinkage of the samples has been remarkably small. For example, in the tenth year of survey of the mean (1976), 69 percent of the original respondents were interviewed, almost half of the remainder having died and the others having disappeared from the sample as the result of their refusal to be interviewed or of the inability of Census enumerators to locate them. The corresponding completion rates for the tenth-year survey of the other cohorts were 78 percent for the women, 71 percent for the boys, and 76 percent for the girls.

---

HERBERT S. PARNES and KEZIA SPROAT are with The Ohio State University, Columbus, Ohio.

the period originally contemplated. Upon the advice of an inter-disciplinary panel that was assembled to consider the issue, plans were made to cover an additional five-year period for each cohort by means of two brief biennial telephone surveys and a face-to-face interview 10 years after the original survey.

During 1976, consideration was given to yet another extension of the study. After a questionnaire survey of all known users of NLS data and a recommendation by an interdisciplinary panel of experts convened by the Department of Labor, decisions were reached in 1977 to continue the surveys of the four samples for an additional five years (so long as attrition did not become a serious problem) and to begin a new longitudinal study of young men and young women. The latter study was to permit a replication of much of the analysis made of the earlier cohorts of youth and also to help to evaluate the expanded employment and training programs for youth legislated by the 1977 amendments to the Comprehensive Employment and Training Act. To these ends, a national probability sample was drawn consisting of 6,000 young women and 6,000 young men between the ages of 14 and 21, with overrepresentation of blacks, Hispanics, and economically disadvantaged whites. The new sample of youth was interviewed for the first time in early 1979, and will be interviewed annually thereafter. Responsibility for drawing the sample, conducting the field work, and preparing data tapes has been subcontracted by the Center for Human Resource Research to the National Opinion Research Center (NORC).

Each of the four original cohorts was represented by a national probability sample of approximately 5,000 individuals. The samples were drawn by the Bureau of the Census from the primary sampling units (PSU's) that had been selected for the experimental Monthly Labor Survey conducted between early 1964 and late 1966.[3] In order to provide statistically reliable estimates for blacks and to permit a more confident analysis of differences in labor market experiences between blacks and whites, a sampling ratio for blacks three to four times as large as that for whites was used.

Close interaction and cooperation has developed over the years between the Center and the Census Bureau at every stage of the research, and has already begun to develop between the Center and NORC. For example, staff members of the Center were generally present at training sessions in which Census enumerators were being instructed in the content of the interview schedules. In pretests, and on a number of occasions in actual surveys, Center personnel were sworn in as special agents of the Census Bureau and accompanied interviewers in order to have a firsthand view of how the interviews were going. On the other hand, while interview content was principally the responsibility of the Center, the Census Bureau provided valuable advice based on their long experience with survey instruments. The division of function between staffs of the Census Bureau and the Center for Human Resource Research has necessitated continuous and very close liaison.

## RESEARCH DESIGN

### Longitudinal Surveys

Before proceeding with a specific description of the NLS research design, it is well to say a few words in general about the nature and the unique capabilities of a longitudinal study. The essence of longitudinal research is that it is based upon characteristics of *the same group of individuals* at two or more points in time. Longitudinal analysis, therefore, involves either an examination of relationships among characteristics of these individuals in different periods or of changes in one or more of their characteristics over time. Conceptually, a longitudinal research design does not necessitate periodic surveys, since information relating to various periods of the past can be collected retrospectively in a single survey. Nevertheless, there are advantages to conducting periodic surveys, since they rely less on the fallible memories of respondents and since certain types of characteristics — especially attitudes — cannot reliably be measured retrospectively.

---

[3] For a detailed description of the sampling design, see *The NLS Handbook* (Columbus: The Ohio State University, Center for Human Resource Research, 1979), pp. 5-13.

A longitudinal research design makes possible answers to questions that cannot be generated in any other way (Parnes, 1972). Perhaps the simplest and most obvious example lies in the quantification of a variety of dimensions of labor market dynamics — e.g., the extent of movement into and out of the labor force, between employment and unemployment, among firms, geographic regions, and occupations. Cross-sectional studies taken at two points in time permit a measure of the net changes that have occurrred in the occupational distribution, for example, but they provide no information on the magnitude of the gross flows of individuals among occupational categories that lie behind whatever change in distribution is observed.

Secondly, longitudinal data provide the only means of identifying the determining factors in developmental processes. For example, what elements in the high school experience of a young man affect the ease of accommodation to the labor market when his full-time education ends? Are there factors in a man's labor market experience during his forties and fifties that condition his retirement decision in his sixties? How does a woman's employment experience prior to marriage or birth of children affect her employment prospects when she reenters the labor market after her children are in school? Cross sectional studies can shed little if any light on these types of questions.

Finally, longitudinal data may permit determination of the direction of causation between two correlated variables, or may make it clear that an ostensible relationship between two variables really reflects the influence of one or more other variables not included in the analysis. As an example of the first of these cases, the cross-sectional relationship between health and labor force status is well known. At least in the case of men, however, there is some ambiguity in this relationship, stemming from the suspicion that economically inactive men may be reporting health limitations in order to provide a respectable excuse for their inactivity. A longitudinal analysis is on somewhat firmer ground, for one can investigate the extent to which the onset of a health problem in one period leads to a subsequent withdrawal from the labor force. Thus we see that a major advantage of the NLS is its longitudinal nature.

## The NLS Data

It is not possible to give here a detailed catalogue of the information that has been collected in the NLS. It will be useful, however, to describe the conceptual framework that has guided the data collection for the four original age-sex cohorts and to delineate the major categories of variables included in the studies. For the sample of youth that has been interviewed for the first time in 1979 the range of variables will be even wider.

*Conceptual framework.* The general purpose of the National Longitudinal Surveys is to identify the factors accounting for variation in the labor market behavior and experience of the five subsets (men, women, young men and women and youth) of the

U.S. population represented by the samples. Accordingly, the theoretical structure underlying the collection of data is both broad and eclectic. An individual's status and behavior in the labor market is conceived to result from an interaction between a variety of characteristics of the individual and those of the environment.

To illustrate, the length of time an unemployed person remains jobless is influenced by both personal and environmental circumstances. One set of relevant personal characteristics are those influencing his or her attractiveness to potential employers, e.g., education and work skills, health and physical fitness, sex, color, initiative, appearance, and age. Some of these may be functionally related to job performance; others may reflect employers' hiring preferences that have little or nothing to do with productivity. A second set of personal characteristics that may be influential are those that determine the range of possible employers to whose attention the individual is likely to come. These include the extent and quality of labor market information, the vigor and ingenuity of job search, willingness to broaden this search outside one's area of residence and usual line of work, and the individual's hierarchy of preferences for different types of work and different kinds of economic and noneconomic rewards. Third, the unemployed individual's economic circumstances also condition the likelihood of reemployment. The extent of financial resources, the amount of income from sources other than working, and the extent of financial obligations all affect "staying power" and thus the subjective requirements established for an acceptable job.

Factors external to the individual and his or her family also are influential in determining labor market experience. Continuing the illustration, for any given set of personal characteristics, unemployment may be expected to be of longer duration in a depressed than in a buoyant economy. The occupational structure of job opportunities, the personnel policies of employers, and the policies of trade unions and government may also help to explain variations in the duration of unemployment. To cite just one example, the higher the level of unemployment insurance benefits, the more selective can the job-seeker afford to be and the longer, other things being equal, is the period of unemployment likely to be.

What has been illustrated above with respect to unemployment is equally applicable to all other facets of labor market experience. Whether interest centers on labor force participation, mobility, or occupational choice, the explanation for the various patterns of behavior or experience that are observed is to be sought in the relationship between individual and environmental characteristics. An individual makes choices and acts in ways that are conditioned by the total complex of his or her characteristics. Behavior is also conditioned by the individual's perception of the environment; but even if environmental factors are misinterpreted or ignored, they impose real constraints upon behavior, and may thus produce outcomes substantially different from what the individual intended.

It should be obvious that no single study can hope to embrace the multitude of complex variables that are implied by the foregoing paragraphs. The National Longitudinal Surveys focus largely on the supply side of the labor market and ask the question "What characteristics of individuals are important in accounting for variations in their labor market status and experience?" Many of the variables are common to all four cohorts, but some are specific to a given cohort. In the remainder of this section the major categories of variables are delineated.[4]

*Employment and unemployment.* The extent of labor market activity of each respondent is measured in several different ways. In each survey, questions are asked that permit the respondent's labor force and employment status in the preceding week to be coded in precisely the same way that it is in the Current Population Survey conducted weekly by the Bureau of the Census (CPS). For the unemployed, a measure of duration is obtained, as well as a specification of methods of job search. In addition, information on number of weeks of employment and of unemployment during the preceding year, number of hours worked in the preceding week, and number of hours usually worked on the current job is also obtained. A very useful measure of labor market activity that was collected in the initial survey of the women is the number of years since leaving school in which the respondent had worked for at least six months.

*Job history.* The NLS survey instruments have been assigned to obtain a detailed work hisotry of each respondent over the period covered by the study, as well as more limited information of this kind relating to the period prior to the initial survey. The retrospective lifetime work history questions vary among cohorts and are more intensive for the men and women than for the boys and girls. Members of each cohort were asked at least two series of questions with respect to previous jobs. For the men, the questions related to the first job after leaving school and the longest job ever held; for the women, the pattern of questions varied depending upon marital and child-bearing status. To illustrate, married women who had never borne children were asked to describe three jobs: the longest between leaving school and date of first marriage; the longest between time of marriage and birth of first child, and the longest since birth of first child. Boys and girls were asked about their first full time job and the job (if any) held during their last year in high school. In all instances, job is defined as a continuous period of service with a given employer or in a self-employed status. Information is obtained on length of service in the job and on the reason for having left it. Also, questions are asked that allow the job to be classified by occupation, industry, and class of worker.

The work history obtained for each respondent over the period covered by the surveys is fairly detailed. In each survey, respondents are asked questions identical to those used in the CPS relating to current or most recent job, which permit coding of occupation, industry, class of worker, weekly hours, and location. In addition, information is obtained on wage rate and, in some of the surveys, on union status. These data, together with information on jobs held between survey dates, permit analysis of interfirm, occupational, interindustry and geographic mobility.

*Socioeconomic and educational variables.* A large number of characteristics relating to the socioeconomic status of respondents and to their health, education, and training have been collected. In the initial survey of each cohort, information was obtained on a number of aspects of the early background of the respondent, e.g., nationality, educational attainment of parents, and family structure

---

[4] For a more complete listing and more detailed description of the variables, see *The NLS Handbook* (Columbus: The Ohio State University, Center for Human Resource Research, 1979), pp. 16-46.

322

when the respondent was a teen-ager. Data on respondent's educational attainment have been obtained for all of the cohorts, in greater detail for the two groups of youth than for the men and women. As a minimum, highest year of regular school completed and type of high school curriculum have been obtained for all cohorts. In addition to this information on formal education, questions have been asked in every survey on the extent, character, and duration of training outside the regular school system.

For the youth, information on current school enrollment status has been obtained in each survey; this information taken together permits analysis of the individual's movement into, out of, and through the formal educational system over the period covered by the study. Field of specialization in college, and amount of scholarship aid in college are illustrative of the additional types of information available for the boys and girls. An index of high school quality has been constructed, based on information from questionnaires sent to the last high school attended by each respondent. Similarly, measures of the quality of higher education obtained by the respondent have been derived from a variety of published information about the college or university attended.

In the initial survey of each cohort, and periodically thereafter, the subjects were asked whether health problems or physical conditions prevented them from working or limited the amount or kind of work they could do. A considerable amount of information has also been collected in each interview about the family characteristics of the respondent. Current marital status has been obtained in every survey; in addition, a retrospective marital history was obtained in the initial survey of the women. In each survey, questions are asked relating to all members of the respondent's family who live in the household, including relationship to the respondent, age, educational attainment, and (for persons of working age) number of weeks worked during the past twelve months, usual number of hours worked per week, and occupation of longest job. Additional information relating to family members includes health condition of spouse, number of dependents, and whether parents and parents-in-law are alive. For employed women and girls with children, information has been collected on type and cost of child care arrangement. For those unemployed or out of the labor force, questions have been asked about the need for child care should the respondent find a job or decide to work outside the home.

*Financial characteristics.* Detailed information on the wealth and income of the subjects and their families has been collected over the several years covered by the surveys, although the degree of detail varies somewhat among cohorts. Using the initial survey of the men as an example, questions were asked about the following types of assets and liabilities: home ownership, farm, business or professional practice, other real estate, automobile(s), savings or checking accounts, U.S. savings bonds, several other forms of financial assets and several types of debt. Information was obtained by using the initial survey of men on the amount of income received by the respondent, his spouse, and other family members from all sources.

*Social psychological variables.* A number of social psychological variables have been used, some uniformly in all four cohorts and others only for one or two groups. Attitudes toward current job have been measured for all four cohorts. These include a measure of attachment to current employer based upon response to a hypothetical job offer elsewhere, and an exploration of factors liked best and least about current job.

The surveys have also attempted to tap a variety of attitudes toward work in general. For example, respondents have been asked whether they would continue to work if by some chance they were to get money to live comfortably without working. They have also been asked what is more important to them about a job: wages or liking the work. In each interview non-employed workers have been asked the circumstances under which they would take a job. For all cohorts there have been questions designed to elicit views about the propriety of labor market activity by mothers of young children. Each survey of the men has included questions relating to retirement plans and expectations.

In every survey of the boys and girls, questions have been asked concerning educational and occupational aspirations, and in the initial interviews with these groups, attitudes toward school experience were explored. For these two groups, scores on mental ability tests were obtained from the last high school attended by each respondent. A labor market information test has been administered to all the young people.

An abbreviated form of the Rotter Internal-External Scale has been administered twice, over a two- or three-year interval, to each of the four samples. This scale purports to measure perceived "locus of control," i.e., whether an individual believes that he is master of his own destiny (internal) or that what happens to him is determined largely by forces over which he has little or no control (external).

*Environmental variables*. Although the National Longitudinal Surveys have focused largely on the supply rather than the demand side of the market, there are nevertheless several environmental variables that have been developed on the basis of the characteristics of the local area in which the respondent resides. These variables, in all cases derived from sources other than the survey instruments themselves, include the population size of the local area, local area unemployment rate, an index of demand for female labor, an index of demand for teen-age male labor, and the presence and type of accredited colleges in the local area.

## THE NLS AND PUBLIC POLICY

There is no way of summarizing briefly the findings based on the NLS data, since they are contained in 18 monographs published by the Employment and Training Administration of the U.S. Dpartment of Labor and over 350 additional articles, theses, and monographs prepared by the staff of the Center for Human Resources Research and researchers throughout the country. It is perhaps sufficient to say that many of the findings have produced better and more confident understanding of the way in which labor markets operate and of the factors associated with successful educational and labor market experience. Thus, in this indirect and subtle way the studies have constituted a valuable contribution to policymakers as well as to researchers.

Perhaps the most exciting research opportunities and the most valuable potential contributions to public policy will come when the data from the new youth survey become available. This survey has been designed to permit more sophisticated evaluation of publicly-funded training programs than has hitherto been possible. It provides oversamples of populations most likely to enroll heavily in programs sponsored by the Comprehensive Education and Training Act (CETA) in order to assure statistically valid conclusions about their experiences. The subsequent labor market experiences of CETA program graduates will be compared to those of similar youth who were eligible but did not participate. In these analyses we will be able to control statistically for such important variables as family background, ability, motivation, etc.; this will permit us to learn whether and to what extent employment and training programs have been successful and who does well in them. Differences in employment and earnings according to race, sex, and culture will be measured in order to find the extent and causes of labor market discrimination. Comparisons with data from the two older youth cohorts will be made, and it is expected that several differences will appear between the labor market experience of young people who began employment in the late 1960's and the early 1970's and those who are starting out in the late 1970's and early 1980's.

## REFERENCE

Parnes, H. S. Longitudinal survey: Prospects and problems. *Monthly Labor Review*, February 1972, pp. 11-15.

# Nonexperimental Evaluations of Employment Service Influence on Search Times and Earnings

ARNOLD KATZ
University of Pittsburgh

The goal of improving the job-matching process has been a consistent aim of the Federal-State Employment Service (ES) since its inception with the Wagner-Peyser Act of 1933. Today, with an expansive network of about 2400 local offices and an annual budget of over $500 million, the ES has become one of the most visible and important of the nation's employment programs. In view of this, it is disconcerting that so little is known of the actual impact which the ES has had on the lives of its job applicants. Yet, there are major difficulties to be overcome if we are to increase our understanding. This paper reports on the findings of some recent research on ways of improving the methodology for evaluative studies of the ES.

The major objectives of the research to be summarized were:

1. To analyze the conceptual issues in isolating the contributions of the ES, if any, to reducing the unemployment of ES applicants.
2. To explore methods of estimating the contributions of the ES to the earnings of its individual applicants.
3. To determine the feasibility of estimating these and other related influences of the ES from experimental data sources.

The study looked primarily at two data bases. The first of these, the 1972 BLS Jobfinders Survey (JFS), is an encompassing household survey of job search experiences. A large number of observations, combined with a detailed view of the search activities in which persons looking for work become involved, made this a promising vehicle for examining what might be learned about the ES from household survey data. The JFS was used primarily to see what such data can tell us about the ES contributions to reduce search times, and through this, to individual applicant's expected lengths of unemployment.

The second data base was amalgamated from the Employment Service Automated Reporting System (ESARS) and Continuous Work-Benefit History (CWBH) files of the Pennsylvania Department of Labor. Both ESARS and CWBH contain administrative records similar to those maintained by the Employment Service in many states. ESARS records the specific services provided to ES applicants in each fiscal year. CWBH is a longitudinal sample of payroll records of the firms which pay unemployment insurance taxes. By linking ESARS with CWBH, we were able to examine how the specific services listed in ESARS were related to before and after earnings extracted from the CWBH.

Household surveys, like the JFS, and administrative records, like the amalgamated ESARS-CWBH, provide nonexperimental insights into the influences of the ES. Nonexperimental data have the advantage that they tend to mirror real-life experi-

---

This research was supported in part by a grant from the Office of Policy Evaluation and Research of the Employment and Training Administration. The views expressed are the author's own and do not necessarily represent the official position of the Labor Department. ARNOLD KATZ is with the Economics Department, University of Pittsburgh, Pittsburgh, Pennsylvania.

ences, and yet real-life experiences are not necessarily the most useful for evaluative research. Their major limitation is the difficulty of finding the appropriate comparison groups. ES applicants, for example, tend to differ from other job searchers and, most importantly, their reasons for using the ES are often highly correlated with these characteristic differences. Specifically, ES applicants have greater difficulties in finding jobs, their use of the ES often being an index of an inability to locate work in other ways. This introduces a serious selection bias into comparisons of ES applicant experiences. How does one separate the part due to intrinsic personal characteristics from the ES contribution?

In principle, an idealized policy experiment in which services are randomly denied to otherwise qualified applicants could be used to contrive appropriate comparison groups. Such experiments, in essence, "doctor" real-life by sorting "subjects" into categories that can be more meaningfully compared. A recent attempt by the Stanford Research Institute (Johnson, Weiner, Hall, Brent, Munson and Coon, 1979) to conduct an ES policy experiment encountered major legal and pragmatic obstacles and had to be abandoned. Where policy experiments have proven more practical, as in the negative income tax tests, the costs of the experiments have proven enormous (Pechman and Timpane, 1975).

Given these limitations, there are many questions that simply cannot be addressed through policy experiments. As a practical necessity, policy evaluations must usually make do with nonexperimental data, which is why our research concentrated on methodologies for dealing with data of this kind.

## INFLUENCES OF THE ES ON TIME SPENT IN JOB SEARCH

Suppose that one could compare the search times of a group of randomly selected job applicants of the same race, education, skills, usual weekly earnings, and numerous other traits. The data available through the JFS permitted us to do just that. Our initial finding was that persons applying to the ES take *longer* on the average to find a job than persons with the identical *observable* characteristics who never apply. What is the meaning of this result?

Possibly, it is an intended outcome of ES programs. Some persons are intimidated by the prospect of being without work and accept less desirable positions than they might be able to find with a more intensive search. Insofar as the ES bolsters the optimism of individuals in this category, the mean search of ES applicants might well be longer than the average, with good results for the applicant and the overall labor market as well.

We suspect, however, that individuals' attitudes toward their job prospects are more symmetrically distributed. Overall, as many applicants with overly-optimistic as with overly-pessimistic attitudes towards their job chances seem likely to turn up as ES applicants. Hence, it is doubtful that one could explain our finding, which applied across the board to all categories of applicants, on such grounds.

It seems likelier that our careful standardizations were unsuccessful because the very act of applying to the ES is related to intrinsic behavior patterns of job searchers. We find, for example, that jobs filled through the ES are systematically lower-paying and less attractive than the jobs found in other ways by applicants with equivalent training and experience. This bears out a widespread feeling that the best openings are rarely listed with, or filled by referrals from, the ES. To the extent that this is common knowledge, it is bound to have a highly significant influence on the behavior of job hunters. Although the cost of inspecting ES listings is normally low, the cost of following them up may be substantial. The low expected return therefore probably discourages an extensive use of the ES in the early stages of a job hunt. There is an understandable tendency to use the ES more extensively later on as a "back stop," once an applicant's more promising sources of information have been exhausted. This tendency means that persons likeliest to have come through the ES are likeliest as well to have been searching longer than other applicants.

Many of our other findings are consistent with this interpretation. Abstracting from the persons receiving unemployment benefits and who thus were required to register with the ES, the propensity to apply to the ES was very low, seldom rising to more than a quarter of the eligible applicants in most population groups. This is a low usage rate considering that ES services are provided without fees. It is consistent with the back-up role since most searchers either give up looking or find acceptable employment within a month. The group attracted to the ES as a contingent information source would necessarily be small. Moreover, we found that on-the-job searchers (applicants who began to search while still employed) made very little use of the ES unless they lost their jobs and became unemployed. Of all the searchers who did use the ES, more reported using it as a secondary source of information after relying in the first instance on some other way.

As there is no doubt a large element of chance in the search for work, the circumstances that decided who applied to the ES are difficult to track in the "backstop" case. This could explain why we discovered the search experiences of outwardly similar persons to differ, on average. The selection process tends to lead the unlucky to the ES. The more fortunate find jobs via other routes. The differences between the lucky and the unlucky applicants of given skill, experience, etc. depend on attributes that are extremely difficult to detect. They may in fact be inherently unobservable.

If it were possible to perform an experiment, the biases of the selection process could be averted by intercepting applicants at the point at which they applied to the ES, or by limiting the evaluations to samples of the unluckier searchers. As this is impossible with nonexperimental data, it is necessary to find some way to control for the influence of the unobservables which explain the intrinsically longer search times of many ES applicants.

Suppose, for example, that search is a "fair" gamble for the population at large. We may then assume that the unobservables add an interval, let us call it u, to everyone's search that shortens search time for some ($u < 0$), lengthens it for others ($u > 0$), but whose overall effect is normally distributed with the plusses and minuses offsetting ($E(u) = 0$). The selection process, on the other hand, is anything but symmetric. Everyone whose search takes longer than expected, say by some amount $u^*$, applied to the ES. The average unobservable for ES applicants is therefore u2, while the average for the others is u1. The difference between u2 and u1 is the sample selection bias, or the amount by which the search times of outwardly similar applications can be expected to differ, depending on their use of the ES. Our technique imputes this u2 vs. u1 effect from the divisions of the normal distribution implied by the usage of the ES (i.e. the relative frequencies of cases to the right and left of $u^*$), which can be observed. (See Katz, 1977, 1978, and 1979 for a fuller explanation of these techniques. The approach taken infers the values of $u^*$ from economic theories of job search.)

The evaluations in our study were based on the reports of white male job applicants who were not receiving employment benefits and who thus could be considered to have applied to the ES voluntarily. After making adjustments of the kind just outlined, there was impressive evidence that use of the ES reduces the time spent in search. With appropriate allowance for the "backstop" effect, search times were on the order of 10 to 20 percent shorter than might have been expected if the group, as a whole, had been deprived somehow of access to the services of the ES.

We were able to identify as well categories of applicants who were likelier than others to have used the ES as a backup. These consisted mainly of on-the-job searchers, persons who had left a previous job voluntarily, new entrants, and reentrants to the labor force. All of the shortening of search time that we could observe was concentrated in this group, who made up about two-thirds of ES applicants. Thus, the "backstop" effect appears to have been highly significant and the source of most of what the ES does to reduce the time spent in research.

Somewhat more tentatively, we discovered that the ES may actually have lengthened the search times of disadvantaged searchers who were living in poverty areas and typically employed in low-wage jobs. Though the interpretation of this finding is not completely clear, this is a distinctive group with decidedly pessimistic expectations about their job prospects. It may be that the ES sometimes bolsters their expectations with tentative commitments to preferential referrals of those who are willing to wait for the right situations to develop.

## INFLUENCES OF THE ES ON INDIVIDUAL EARNINGS

The savings in search time which we observed seem to have been brought about mainly by the willingness of unsuccessful searchers to accept less attractive offers, more readily available through the ES, as a condition of returning sooner to work. This naturally raises the issue of whether reductions in pay in accepting ES positions are worth the earnings losses avoided by searching for a briefer time. The ESARS-CWBH date therefore complements the search time study by giving us insight into how the earnings changes of ES applicants compare with the ES influences on the lengths of job search.

The study of earnings through the ESARS-CWBH had to be put on a somewhat different footing than the investigations of search time because the ESARS-CWBH is restricted to ES applicants. The investigations of ES influences on earnings were carried out, therefore, by looking into how the earnings experiences of applicants receiving specific services compared to nominal applicants who, though they registered with the ES, were either offered or found uninteresting prospects and so ended up accepting no specific services. More concretely, we compared the earnings experiences of white males either placed or referred by local offices of the Pennsylvania ES in the reference fiscal period 1972-73 with the earnings experiences of a comparable group of nominal applicants in the same period. Our inferences regarding the comparative outcomes for the two groups are based on the estimated changes in earnings, relating the pay received over a period of 12 to 18 months following the application period to earnings in the two year interval before applying to the ES.

Here again, there are serious problems of selection bias because the comparison groups are hardly chosen at random. The biases that affect the earnings comparisons are even more difficult to analyze than in the search time example. In the search time case, it was fairly clear that the observed search times of ES applicants would be longer than the search times observed of other applicants because of the "backstop" effect. In this case, earnings changes of both placements and referrals tend to be inflated if applicants act in their own best interest, that is, nominal applicants being worse off in accepting ES offers, and vice versa. This is a fairly typical example of the problems that may be encountered in using nonexperimental data. Since the "subjects" choose their own categories, it is usually difficult to predict the extent of the bias. Applicants placed or referred may have wound up with either greater or lesser improvements in earnings than the nominal applicants. The differences between their observed earnings changes are simply not indicative of what we might reasonably expect to have happened had the ES placements been forced to switch places with the nominal applicants, or conversely. Yet the implications of such role reversals are precisely what we want to know for programmatic evaluations.

Roughly similar techniques, as were sketched out for the study of search times, were applied here as well as to impute the unobserved experiences that we wanted to estimate. Administrative records omit a variety of information about detailed personal traits that can often be obtained through a household survey. This puts a greater strain on the adjustment techniques and may have reduced their effectiveness. We also ran into problems in matching individual earnings records since, in certain cases, it was necessary to pull together reports on the same individuals over a five year period for the requisite pre-application and post-application comparisons. Individual identifiers in ESARS and CWBH appear not to have been as carefully edited as needed because these data are rarely used in matching studies of this type. Notwithstanding, the results obtained were highly plausible, though it should be remembered the findings are exploratory and restricted to Pennsylvania.

Perhaps our most important finding, true whether the data were adjusted for selection biases or not, is that ES placements and referrals appear to channel applicants to more continuous employment than nominal applicants were likely to have found for themselves. The ESARS-CWBH data confirm that the wage rates paid in ES jobs are lower, but the loss in wages is almost fully offset, on average, by the gain in annual earnings which results from the improved stability of employment. This is important because it implies that if the findings from our national data can be validly related to the Pennsylvania experience, the value of the earnings losses avoided by the average estimated savings in search time are significantly greater than the modest losses in annual earnings estimated for Pennsylvania ES applicants. The net benefit, in other words, of the ES contribution to search times appears to be significantly positive.

Among our other findings, we discovered that the earnings reports often made it appear as if the experiences of applicants placed or referred were more favorable than they turned out to be once the corrections for selection biases were applied. In every case examined, the administrative reports overstated the earnings gains, or understated the earnings losses, attributable to ES placements and referrals in comparison with the corrected estimates. As explained before, it is extremely difficult to predict beforehand whether this may be true, but the perils implied in taking nonexperimental data at face value should be self-evident.

Once the proper adjustments for unobservable outcomes had been made, it was possible to project what the earnings experiences of the nominal applicants might have been had they been offered and/or accepted ES offers, and to do the same for placements and referrals, projecting their experience with sources out-

330

side of the ES. The results confirmed that applicants in either group acted in their own best interests, choosing the alternative with the higher personal payoff. The projected experiences of nominal applicants, had they accepted ES offers, were particularly adverse by comparison with their actual earnings, which may imply that extensions of current ES services to wider groups would be unadvisable. The findings must *not* be interpreted to mean the ES does not contribute to earnings. Those placed or referred fared significantly better with ES help than in the projections without.

Time did not permit us to fully utilize the wealth of potentially interesting evaluative data in the ESARS-CWBH files. It might have been highly productive, for example, to have studied the earnings changes of other applicant groups, those receiving counseling and testing or other services, for example. We would also have liked to compare the results for men and women, using our techniques. Shulenburger, Krieder, and Pichler (1979) have now put together a similar data file for Kansas, and we anticipate that others will be following suit. This is an encouraging development. The information gathered through these reporting systems can provide more useful data for monitoring ES programs on a continuous basis at a reasonable cost. We also anticipate that the quality of these data will greatly improve with more frequent use. The more researchers who are laboring to realize the potential of these reports, the fuller the understanding we may achieve of what consolidations of the ESARS and CWBH reporting systems have to contribute to our understanding of ES influences.

## CONCLUSIONS

Though fundamentally methodological, our research turned up a number of substantive evidences of job applicants benefiting significantly from their individual contacts with the ES. We were dubious that an exploratory study employing techniques still under development would yield anything of substance at such an early stage. There may therefore be reason for bullishness over the prospects of further progress in nonexperimental evaluations of the ES. Of course, this is a question that each researcher must decide individually. We hope that, within the space constraints, the reader has seen a fair enough sample of the inferences it may be possible to draw from research of this kind.

## REFERENCES

Johnson, T., Weiner, S., Hall, A., Brent, D., Munson, E., & Coon, M. *A pilot evaluation of the impact of the U.S. Employment Service* (final report). Stanford Research Institute, January 1979.

Katz, A. Evaluating the contributions of the employment service to applicant earnings. *Proceedings of the meetings of the Industrial Relations Research Association*, Spring 1977.

Katz, A. *Exploratory measures of labor market influences of the employment service*. Report to the U.S. Department of Labor, August 1978. (NTIS No. DLMA 21-42-75-13)

Katz, A. Contributions to the employment service to search times: A search theoretic study of censoring bias. January 1979. (Forthcoming)

Pechman, J., & Timpane, M. (Eds.). *Work incentives and income guarantees: The New Jersey negative income tax experiment.* Brookings Institution, 1975.

Shulenburger, D., Krieder, C., & Pichler, J. The impact on earnings of the employment service. *Industrial Relations*, Winter 1979.

# Documentation and Evaluation of CETA-Education Linkage Efforts and Activities in the Commonwealth of Virginia

MAX S. WORTMAN, JR.,
SUZANNE KARSA MURRMAN,
and NATHANIEL JONES
Virginia Polytechnic Institute
and State University

## INTRODUCTION

Several crucial problems face employment and training agencies today including (a) lack of adequate facilities, personnel, and equipment; and (b) inadequate curricula for specific vocational-technical training programs. Recent changes in federal legislation have forced prime sponsors to re-evaluate program mixes and to consider shifting services from work experience type programs toward basic educational and vocational offerings. These changes are most obvious in the Youth Employment and Demonstration Project Act of 1977 (YEDPA). Renewed emphasis has been placed on youth along with the role of education in their training. Collaborative efforts between the Comprehensive Employment and Training Act (CETA) prime sponsors and local education agencies (LEAs) have been mandated in YEDPA. These collaborative efforts are closely aligned with many educational priorities of LEAs, especially in view of the increased availability of facilities and resources due to shrinking student enrollments throughout the educational system at all levels. Even without the mandates imposed under CETA (for prime sponsors) and imposed under educational legislation (such as the Vocational Education Amendments of 1976), cooperative efforts clearly must take place in order to ensure adequate services for youth and adults who are seeking assistance of many different types in the labor market.

Since the enactment of YEDPA, a number of publications have been produced by both the federal government and private organizations to familiarize prime sponsors and education with federal mandates in the area of CETA-Education coordination. Some materials have provided information on goals, objectives, and intent of the new youth programs (U.S.D.O.L., 1977), while others have described new youth program models and innovations (U.S.D.O.L., 1978). In a few instances, state level agencies have provided assistance to local educators, human resource planners, and others in developing new youth programs (Michigan Department of Labor, 1977).

Unfortunately, very few studies conceptualize linkages between CETA prime sponsors and educators. One study analyzed cooperative efforts under the special Governor's grants at the post-secondary vocational education level and focused on the various patterns which individual states have developed for the disposition and utilization of CETA Title I, five percent monies (since these monies may provide one of the best possible long-range answers for effecting CETA-post secondary vocational education program linkages) (Proaction Institute, 1978). In another study (Cas-

---

MAX S. WORTMAN, JR., SUZANNE KARSA MURRMAN, and NATHANIEL JONES are with the Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

sell et al., 1976), six major barriers to communication among manpower related agencies were identified:

1. Communication methods.
2. Confusing and conflicting rules and regulations.
3. Turf.
4. Information.
5. Planning cycle problems.
6. Goal incongruence and role confusion.

These general barriers to effective administration of employment and training programs cannot automatically be assured of applying to CETA-Education linkages although many have been shown to be applicable to the CETA-post-secondary vocational education linkages study. Nevertheless, they may be important barriers in preventing the effective accomplishment of employment and training program goals.

Clearly, studies that identify successful coordinative efforts between employment and training agencies and educational institutions are badly needed (U.S.O.E., 1977).

Although case studies of successful programs have been done on CETA-Education relationships at the local level (U.S.D.O.L., 1978), this study will investigate both "success stories" and examples of coordinative plans being attempted by prime sponsors and educators. Special attention will be paid to mechanisms used for successfully carrying on relationships that were formed during the planning process. From the analysis of successful CETA-Education linkages, a system will be developed that can be used by agencies concerned with CETA-Education linkages (CETA prime sponsors, educational institutions, and state agencies). The system should be helpful to other state and local agencies for coordinating other types of non-CETA programs.

## METHOD

### Procedure

The research project can be divided into two stages: (1) the analysis of the present linkage system in the Commonwealth, and (2) the assessment of future linkage needs.

*Analysis of present linkage system.* Present linkages in the Commonwealth of Virginia can be identified through an analysis of local programs and activities. Documents, reports, statistical data and pertinent information dealing with CETA-Education linkage activities can be obtained from federal, state and local agencies and institutions. Federal information will be obtained from regional offices of appropriate federal agencies. State data will be obtained from state agencies, advisory committees, and commissions. Local information will be obtained from prime sponsors, balance of state regional offices, and post secondary and secondary educational institutions dealing with prime sponsors. Following the return of all documents and information, an analysis of present linkages in the Commonwealth will be initiated. Information gathered in this stage will be used to develop an instrument for on-site interviews at local and state levels.

Before designing the interview instrument, criteria for identifying and determining the constituents of successful linkage(s) will be established. Then the instrument will be designed to gather specific programmatic data and identify successful linkage activities and mechanisms used to overcome barriers to program coordination. The instrument will focus on both objective and subjective measures of successful linkage(s) including: (1) types of resources available for coordination between prime sponsors and educational institutions, (2) how these resources are pooled, (3) client population served, (4) who secures placement for the program trainees, and (5) who provides staff and training facilities.

In the interview process, heavy emphasis will be placed on the identification of boundary spanners. In this study, boundary spanners can be described as those active in the Governor's Employment and Training Council and local advisory councils, individuals acting in a liaison capacity between groups of prime sponsors and correlated local educational agencies and post secondary educational institutions, and those possessing an outreach role in their organizations. An equally important aspect is in the area of prelinkage communication between prime sponsors and educational institutions. These boundary spanners and their developmental activities and their relationship to successful linkages will be emphasized. In this way, the degree of dual involvement of CETA and education can be studied in depth.

To supplement initial documentation, investigators will use this instrument in the field to interview prime sponsors, the balance-of-state regional offices and educational institutions having coordinative activities. These interviews will serve to broaden or clarify the initial documentation and provide relevant organizational, programmatic, and personal data for a complete project analysis. In addition to these interviews, any additional reports, documents, and other related educational needs in the area deemed relevant by prime sponsors and educational agencies and institutions will be collected. At this point, the data base for identifying effective mechanisms for linkages facilitating coordination will have been established.

The data base will then be used to analyze selected programs in terms of overall effective linkages. Structural, operational, planning and programmatic processes in the programs will be analyzed in detail to identify procedures, strategies and interpersonal relationships which are conducive to successful programs. These will be generalized into a guideline format containing specific recommendations. Moreover, these guidelines will provide recommendations for appropriate transferability of successful methods to other employment and training programs in Virginia. The data and records and the information from current CETA-Education linkage studies will be used to develop an effective system against which employment and training operations in other institutions and agencies can be compared. Furthermore, the system can be utilized for the development of innovative projects.

*Assessment of future linkage needs.* During the second stage of the project, a questionnaire will be developed and mailed to practitioners in the area of CETA-Education to solicit their perceptions of specific linkage needs for future planning. Analysis of these responses will provide a data base for the documentation of future needs in CETA-Education cooperation.

## RESULTS

Three results are expected from this study of CETA-Education linkages in the Commonwealth of Virginia. First, an analysis of linkage documentation at the state and local operations levels will be compiled. Depending upon the status of these linkages within the state, this compilation will be useful to agencies, prime sponsors, programs, and projects interested in either comparing or executing linkage agreements.

Second, and more important, a descriptive analysis of all current successful linkage efforts in the Commonwealth of Virginia will be completed. Case studies of these efforts will include geographic, demographic, structural, operational, and interpersonnel descriptions of the program, including the participating agencies and institutions. Emphasis will be placed on preliminary activities leading up to contractual arrangements and the identification and success of boundary spanners. This analysis will be based primarily on the measure of effectiveness developed in the interview instrument. A focus will be on both objective measure such as participants served, cost of programs, and local demand for skills taught to participants, and subjective measures of success such as coordination of efforts by agencies involved and innovativeness of programs.

Third, a clarification of specific linkage needs within the Commonwealth of Virginia will include the identification of necessary areas of linkage and an elaboration of their status. This will provide the necessary data for long-range planning purposes in the area of future CETA-Education linkage activities.

## DISCUSSION

This study has been designed to establish the initial groundwork for CETA-Education linkages in the Commonwealth of Virginia. Prior to 1977, it was generally accepted that the speed and means by which the five percent special Governor's Grant for Vocational Education was implemented was an adequate measure of coordination between prime sponsors and education institutions. This assumption is no longer valid. Legislative mandates and funding incentives have made linkage activities increasingly important to both employment and training agencies and educational institutions at all levels. These mandates and incentives include: (1) 1977 Vocational Education Amendment, mandating state council coordination; (2) the Youth Employment and Demonstration Projects Act of 1979, calling for prime sponsor and local education agency cooperation and mandating vocational training in public service employment; and (3) CETA, Title II, Section 202 (d), calling for state encouragement in local level coordination.

The basic question of *process*, being asked by local level agencies has not yet been answered. This study is an attempt to deal with the question of the linkage process. Several integrated efforts have been designed to clarify this linkage process including:

1. The identification of:
    a. Collaborative agreements/linkages between prime sponsors and educational institutions providing educational and training services to prime sponsors.
    b. Collaborative agreements/linkages between prime sponsors and governmental agencies involved in employment and training activities, i.e., service providers, funding agencies and technical assistance agencies.
    c. Collaborative agreements/linkages between federal, state and local agencies (such as working agreements through memoranda of understanding between the Governor's Employment and Training Council and State agencies).
    d. Important elements in these agreements leading to increased coordination.
    e. Crucial variables which contribute to increased collaboration which may include:
        i. Policy Linkages,
        ii. Planning Linkages,
        iii. Structural Linkages,
        iv. Financial (Budgetary) Linkages,
        v. Programmatic Linkages,
        vi. Operational Linkages.

    f. Resources available on either side and request for cooperation of all actors with collaborative agreement to provide information (formal and informal) on how the agreements were achieved.
    g. Particular or unique characteristics of local organizational, administrative and operational systems, which provided the background for such cooperative agreements.
2. The provision of information to the Governor's Employment and Training Council (GETC) as well as prime sponsors, educational institutions and other interested agencies that examines:
    a. Manpower and education legislation as it is related to their linkages.
    b. Alternative ways of replicating programs or transferring programs to employment and training institutions or other agencies capable of efficient and effective delivery of services.
    c. Strategies for increasing collaborative efforts between CETA and Education.
3. The provision of a long-range needs assessment that can be used by both resource and service providers that will:
    a. Determine specific employment and training needs in the state.
    b. Determine specific linkage needs necessary in meeting (a).
    c. Provide an adequate data base for use in future planning.
4. The identification of successful linkage efforts in Virginia that encompass effective coordination mechanisms as well as an ideal system that can be used in a dual involvement by educators and prime sponsors in achieving the optimal use of their funds.

Although this research will give needed insight into linkage activities in the Commonwealth of Virginia, future studies in this area must take place. As further linkage activities take place, their effectiveness must be evaluated. Research into CETA-Education linkages should be an ongoing activity for maximizing joint resources and clientele coverage and minimizing service inefficiency and duplication.

## REFERENCES

Cassell, F. H. et al. *Intergovernmental linkage and cooperation: Models for strengthening state and local management of manpower programs.* Evanston, Ill.: Northwestern University, 1976.

Michigan Department of Labor, Bureau of Employment and Training. *Michigan conference on youth employment coordinating youth with vocational education.* Lansing: Author, 1977.

Proaction Institution. *Description and Evaluation of the impact of the 1976 VEA's upon CETA-post secondary vocational education programs and organizational linkages.* East Lansing: Michigan State University, 1978.

U.S. Office of Education, CETA Coordinating Unit. *Fiscal year 1977 overview of CETA section 112 activities, Title I involvement and advice and comments from the states on educational aspects of CETA.* Washington, D.C.: Author, September 1977.

U.S. Department of Labor, Employment and Training Administration, Office of Policy, Evaluation and Research. *Initial youth employment and demonstration projects act (YEDPA) experience at the local level.* Washington, D.C.: U.S. Government Printing Office, 1978.

U.S. Department of Labor, Employment and Training Administration, Office of Youth Programs. *Impacts on YEDPA on education/CETA relationships at the local level: Five case studies.* Washington, D.C.: U.S. Government Printing Office, 1978.

U.S. Department of Labor, Employment and Training Administration, Office of Youth Program. *Youth Act.* Washington, D.C.: U.S. Government Printing Office, 1977.

# The Economic Decline of College Graduates: Fact or Fallacy?

RUSSELL W. RUMBERGER
Center for Human Resource Research
The Ohio State University

## INTRODUCTION

It is well documented that college graduates have long enjoyed an economic advantage over high school graduates in the labor market. This notion is most often supported by examining the relative earnings of college graduates vis-à-vis high school graduates (Becker, 1964, Mincer, 1974). But other measures of economic position, such as occupational prestige, support this notion as well (Blau & Duncan, 1967). In general, the literature supports the view that a college education is a worthwhile investment.

Recently, however, a number of challenges to this view have emerged. Richard Freeman has concluded that the labor market position of college graduates has deteriorated in recent years so that a college degree is only a marginal investment (Freeman, 1975, 1976). Freeman argues that the earnings of college graduates have declined relative to the earnings of high school graduates, in part, because of the large number of college graduates entering the labor market. He concludes, therefore, that recent college graduates are worse-off than college graduates in times past. Yet other researchers, also using relative earnings, have concluded that college graduates have maintained their economic advantage, even through recent times (Grasso, 1977; Grasso & Myers, 1977).[1] Freeman has been criticized for failing to compare the earnings of young, college graduates with those of young, high school graduates (Grasso, 1977; Levin, 1977).[2] It is difficult to conclude, therefore, whether or not there has been a decline in the relative earnings of college graduates in recent years.

Another challenge to the predominant view has been raised by Lester Thurow (1974, 1975). Thurow posits a "job competition" model to the

---

[1] Actually a number of measures of earnings are used in the literature. Freeman uses both the real starting salaries of college graduates and annual income of year round, full-time employed men with high school or college completion. Grosso (1977) uses hourly wage rates and annual earnings while Grasso and Myers (1977) use hourly wage rates.

[2] That is, he compares starting salaries of new college graduates with the average salaries of the experienced labor force. Grasso (1977) and Levin (1977) raise other criticisms of Freeman's work as well.

---

© Copyright: Russell W. Rumberger, 1979 from the *Journal of Human Resources*, Vol. 15 (forthcoming)

This paper is based on the author's doctoral dissertation research conducted at Stanford University. Support for this project was provided by the Employment and Training Administration, U.S. Department of Labor, under Research and Development Grant No. 91-06-77-23. However, the opinions expressed do not necessarily represent the official opinion or policy of the Department of Labor. The author wishes to acknowledge the advice and assistance of John Pencavel, Henry Levin, and Laura Best. RUSSELL W. RUMBERGER is Senior Research Associate in the Center for Human Resource Research, The Ohio State University, Columbus, Ohio.

labor market in which (1) marginal productivity is associated with jobs rather than individuals (as in the neoclassical case), and (2) education serves as a means of identifying the most qualified (trainable) individuals. In the face of increases in the supply of educated labor, persons with more education will continue to fare better than persons with less education, although the absolute position of educated workers may actually worsen over time as many are forced into lower-level jobs. In other words, according to Thurow's view, relative earnings between college and high school graduates *may* or *may not* have declined in recent years, yet the *absolute* occupational position of college graduates may have deteriorated nonetheless. Again the evidence to support Thurow's view is inconclusive. But other researchers have offered data that suggest many workers, including both high school and college graduates, face a "poor" labor market situation because they often fail to find jobs commensurate with the level of training they have received in school (e.g., Berg, 1971; Rowlins & Ulman, 1974).

The purpose of this paper is to examine the economic position of college graduates between 1969 and 1975 using new data in order to test the validity of Freeman's and Thurow's views. Specifically, two hypotheses are tested: (1) the economic position of college graduates, as measured by relative earnings, did not deteriorate appreciably between 1969 and 1975, and (2) the absolute occupational position of college graduates did worsen during this period when occupational position is measured by the degree of utilization of educational skills. The second issue of occupational position attempts to measure directly the utilization of education in the labor market by examining the general skill requirements of jobs and contrasting them with education (which is assumed to provide cognitive skills and abilities in the labor market). Thus it avoids some of the shortcomings of an index based on relative earnings, which are subject to the imperfections of the market (Eckaus, 1964). But it too has its shortcomings, as will become evident from the discussion in the next section.

By using two different measures of economic position in the labor market, we should be able to determine (1) whether the economic position of college graduates has worsened in recent years, and (2) whether either Freeman's or Thurow's challenge to the predominant view is supported by the evidence.

The remainder of the paper is divided into three sections. The next section presents the methodology of the study. The section following contains the empirical results. In the last section, I will draw some conclusions based on the empirical findings and make some recommendations for further research.

## METHODOLOGY

### Sources of Data and Populations

To investigate changes in the economic position of college graduates, cross-sectional analyses were performed for two different years: 1969 and 1975.[3] Census data were used since they are taken from a representative sample of the U.S. population and contain information on earnings, occupation and industry where employed, personal characteristics, and other relevant information.

---

[3] These years represent contrasting periods in the U.S. economy. The year 1969 marked the end of a decade of rapid economic growth while 1975 was a second straight year of decline in real GNP. Consequently, there were increases in the unemployment rates, especially for young workers and those with low levels of schooling. There were also increases in labor force participation rates for young whites but decreasing rates for young, black males and steady rates for young, black females (see U.S. Department of Labor, 1977, Tables A-4, A-6, G-3). There is, of course, an inherent weakness in undertaking cross-sectional comparisons — they can mask trends. Nonetheless, such comparisons may still provide useful information. In this case, the years 1969 and 1975 may represent a high and a low point in the cyclical variation of relative wages. For a comparison with earnings from other years, see Welch (forthcoming).

The March 1976 Current Population Survey (CPS) was used to evaluate the contemporary situation. This survey, conducted every year, serves as a continual source of information on the labor market situation by both the Census Bureau and the Bureau of Labor Statistics (U.S. Bureau of the Census and Bureau of Labor Statistics, 1976). The other cross-section was taken from the 1970 1/1000 Public Use Sample (U.S. Bureau of the Census, 1972). These data, a random subset of the 1970 decennial survey, contain similar information to that in the CPS. However, since the two surveys were administered differently, the data they yielded are not strictly comparable.[4]

From these two surveys I extracted the inexperienced labor force — those individuals who have been working (employed or unemployed at the time of the survey) less than five years.[5] Since the Census data do not contain years of experience, the variable had to be estimated from other data as follows:

Years of experience = Age − Years of schooling − 6. Those persons with estimated experience levels between 0 and five years were included in the inexperienced labor force. Obviously, this approach is subject to error. It assigns years of experience based on a "normal" progression through school. For example, an individual who is currently working at age 18 with 12 years of schooling completed is assumed to have 0 years of work experience while, in fact, he or she may graduate at age 17 and have one year of work experience. Also, this method does not distinguish between full-time and part-time experience. The effects of a year of part-time work experience may not be the same as a year of full-time work experience.[6] In spite of these shortcomings, this approach is the best available within the limitations of the available data.

The samples contained information on annual earnings reported for the previous year (i.e., 1969 and 1975), weeks worked the previous year, marital status, sector where employed (private, government, self-employed), years of schooling completed, and current occupation. Mean weekly earnings were calculated by dividing annual earnings by weeks worked the previous year.[7]

## Model 1: Relative Salaries

The first measure of economic position is based on relative salaries between persons of different schooling levels. It is a traditional index of economic "well-being" used to measure returns to investment in schooling. One of its shortcomings is its failure to capture other pecuniary and non-pecuniary returns to schooling (Duncan, 1976; Lucas, 1977). Also, it is difficult to calculate returns to schooling "net" of differences in ability or of consumption components (Blaug, 1972; Eckaus, 1973). However, it is considered to be the standard basis for estimating the profitability of educational investment.

---

[4] In particular, revisions were made in processing after March, 1975, which increased the reported earnings of college graduates relative to high school graduates. See U.S. Bureau of Census (1977) for a description of these changes and how the CPS data compare with data from the 1970 Decennial Census. I employed the Decennial Census instead of another year of the CPS because the former was readily available at the time I conducted this research.

[5] The census only collects labor market information on persons 14 years old and older. We, therefore, must confine ourselves to this group. Also excluded from the analysis were those working without pay.

[6] The 1970 Census did not identify whether a respondent's principal activity during the reference week was working or attending school. Persons with less than zero years of estimated work experience were, therefore, excluded from the samples in order to focus the analysis on those individuals who were most likely to be full-time labor force participants. This procedure may bias the samples by excluding workers who finished school and entered the labor market early. However, since the samples for 1970 and 1976 were selected in the same manner and since, primarily, we are interested in comparisons between the two years, the resulting bias should not pose a problem.

[7] For the 1970 data, only interval ranges of weeks worked were reported so the midpoint of these intervals was used.

The following earnings function is posited to explain the relationship between earnings and education, controlling for several other factors:[8]

$$(1)\ \ln W = \alpha + \sum_{i=1}^{5} \beta_{1i} X_i + \beta_2{}^E + \sum_{j=1}^{2} \beta_{3j} Y_j + \sum_{k=1}^{2} \beta_{4k} Z_k + e$$

where: W = mean weekly earnings

$x_i$ = Dummy variables representing years of schooling completed, with
- i = 1 representing 0-8 years
- i = 2 representing 9-11 years
- i = 3 representing 13-15 years
- i = 4 representing 16 years
- i = 5 representing 17+ years

E = Years of experience

$Y_j$ = Dummy variables representing marital status, with:
- j = 1 representing presently married
- j = 2 representing previously married

$Z_k$ = Dummy variables representing sector where employed, with:
- k = 1 representing public sector
- k = 2 representing self-employed

From this earnings function, one can make comparisons between the adjusted earnings of persons with different years of schooling. One can also observe relative changes between 1969 and 1975.

### Model 2: Utilization of Educational Skills

The second index of economic position involves measuring discrepancies between the educational attainments of workers and the general skill requirements of the job that they hold. This index is not new; it has been used by others to examine conditions in the labor market (Scoville, 1966; Miller, 1971; Lucas, 1972).

But constructing this index presents several problems. It requires information on the skill requirements of jobs, determined independently of the characteristics of workers in those jobs. This information does exist in the *Dictionary of Occupational Titles* (DOT), issued by the U.S. Employment Service (1965). The Employment Service periodically collects information on the characteristics of jobs in the U.S. economy, including information on general skill requirements (referred to as General Educational Development (GED)). These requirements are supposedly determined solely from the tasks of the job and not the characteristics of the worker in the job (see U.S. Department of Labor, 1972, Chapter 5). But it is by no means a perfect system (see Rumberger, 1978, Chapter 3). For the purposes of this paper, though, we will assume the independence between educational attainment and skill requirements. Another limitation of this approach is its failure to account for changes in skill requirements over time. It is reasonable to assume that the skill requirements of a job rise or fall as the tasks of the job change; however, such change is unlikely to be substantial over such a short period. The results may understate (overstate) the amount of overeducation to the degree that the skill requirements of jobs have decreased (increased) during this period.[9]

---

[8] Coefficients will show percentage differences between any given schooling category and the omitted category: 12 years of schooling. Actually, it is possible to compute relative earnings based on either absolute differences in earnings or ratios. It is absolute differences that form the basis for social and private investment decisions in education while employer demand is based on the ratio of relative earnings, as Becker (1964) points out. Ratios are used here in order to make the results comparable with those of other studies.

For the purposes of this study, constructing the second index necessitated two tasks: (1) assigning appropriate skill requirements of jobs to respondents from the two surveys based on their current occupation, and (2) translating these requirements into equivalent years of schooling. The first task was accomplished using the April, 1971, CPS. Respondents in that survey, in addition to being coded by Census occupation codes, were coded by DOT occupation codes and their corresponding level of GED. By cross-tabulating Census occupation with GED levels, it is possible to determine the probability of holding a job with a certain GED level given one's Census occupation code. From these probability distributions, the mode GED level was determined for each Census code. In most cases, this served as a fairly accurate estimate of GED requirements since most census occupations were concentrated in one GED category. Respondents in both the 1970 and 1976 surveys were then assigned an appropriate GED level.

The second task involved translating GED levels into equivalent years of schooling. This, too, was a difficult task. First, years of schooling are not homogeneous — they could represent different amounts of training due to individual variations in school performance, courses studied, and the quality of the institution attended. Second, GED levels actually represent a composite of general skill requirements — general reasoning, mathematical ability, and verbal ability (U.S. Employment Service, 1965, Vol. 2, Appendix B). The relationship between years of schooling and GED levels is rather unclear. But Eckaus (1964) suggested an equivalency that was used in this investigation.[10]

The empirical investigation of changes in economic position of college graduates was performed by constructing an index of years of "overeducation" for each respondent as follows:

(2) Overeducation (in years) = Years of schooling completed − GED (in years)

The highest schooling level from each GED level was used as equivalent years of schooling:

| *GED Level* | *Equivalent Years of Schooling* |
|---|---|
| 1 | 4 |
| 2 | 7 |
| 3 | 10 |
| 4 | 12 |
| 5 | 16 |
| 6 | 18 |

The following function was then evaluated:

$$(3)\ 0 = \alpha + \sum_{i=1}^{5} \beta_{1i}X_i + \beta_2E + \sum_{j=1}^{2} \beta_{3j}Y_j + \sum_{k=1}^{2} \beta_{4k}Z_k + e$$

where: 0 = years of overeducation
all other variables are as defined in equation (1)

---

[9] Bear in mind that to a large degree changes in the nature of jobs are associated with new capital investment. The short period of analysis and the low capital formation in this period suggest minimal changes in job specifications. For an analysis of the changing skill requirements of jobs, see Rumberger (1978).

[10] Eckaus' equivalency probably represents a conservative estimate. A more recent Department of Labor publication uses lower estimates for equivalent years of schooling than those proposed by Eckaus (U.S. Department of Labor, 1971). In this paper, only the results based on the more conservative estimates are reported. Using other levels did not alter the direction of the results, just the magnitude. Only further research can accurately determine the translation of GED levels into years of schooling.

This equation estimates years of overeducation in equation (1) of different schooling levels, controlling for the effects of other variables.[11]

## RESULTS

To test the first hypothesis, the coefficients of equation (1) were estimated using ordinary least squares. The results appear in Table 1. The left-out dummy variables are: 12 years of schooling completed, single, and employed in the private sector.

The results indicate that, in general, the earnings of college graduates did not decline relative to high school graduates between 1969 and 1975.[12] The relative earnings of white males with four years of college declined only slightly between 1969 and 1975, while those of black males improved significantly. The position of workers

### TABLE 1

Estimated Earnings for Inexperienced Males by Race; 1969 and 1975

| | Whites | | Blacks | |
|---|---|---|---|---|
| | 1969 | 1975 | 1969 | 1975 |
| Schooling | | | | |
| 0-8 Yrs. | −1.81** | −1.79** | −1.53** | −1.22** |
| 9-11 Yrs. | −.78** | −.83** | −.51** | −.75** |
| 12 Yrs. | — | — | — | — |
| 13-15 Yrs. | .13** | .05 | .08 | .06 |
| 16 Yrs. | .43** | .40** | .46 | .92** |
| 17 + Yrs. | .65** | .49** | 1.00* | .99* |
| Experience Yrs. | .15** | .16** | .11** | .18** |
| Single | — | — | — | — |
| Married | .46** | .43** | .58** | .53** |
| Previously Married | .29* | .42** | −.65 | .36 |
| Private Sector | — | — | — | — |
| Public Sector | −.04 | −.10* | −.01 | −.22 |
| Self-Employed | −.00 | −.58** | .54 | .24 |
| Constant | 3.65 | 3.98 | 3.29 | 3.51 |
| $R^2$ | .32 | .32 | .15 | .20 |
| # of Observations | 7743 | 6355 | 715 | 525 |
| Mean Weekly Earnings | 96.33 | 125.06 | 70.92 | 99.65 |
| Ln Earnings | 3.9 | 4.2 | 3.4 | 3.9 |
| Exper. Yrs. | 2.1 | 2.2 | 2.3 | 2.7 |
| Age — Yrs. | 20.5 | 20.8 | 19.6 | 20.4 |

+ Significant at .10 level
* Significant at .05 level
** Significant at .01 level

---

[11] Levin (1977), in a private discussion, suggested that equation (3) be rewritten to exclude the control variables. The equation would then estimate the gross relationship between the two primary variables — overeducation and years of schooling — instead of partitioning it among the control variables. Actually a two-step regression was run on equation (3) with years of schooling introduced in the first step and the control variables entered in the second. There were few differences in the estimated co-efficients of education between the two steps.

[12] Differences between whites and blacks will not be addressed in this paper in order to concentrate on the task of examining changes between years within each group. In general, differences between blacks and whites support the notion that whites fare better than blacks in the labor market, although the differences appear to have lessened during the period under investigation.

with other educational credentials remained similar between the two years, except for the relative decline experienced by white males with one-three years or more than four years of college. Overall, the results reported here suggest that there has not been a marked decline in the economic position of college graduates in recent years, at least as measured by relative earnings.[13] These results challenge the contention of Freeman (1975, 1976) that the relative earnings of college graduates have been declining in recent years.[14] Other results indicate that in recent years (1) relative earnings have fluctuated, in part, because of business cycles, and (2) large increases in the number of young workers entering the labor market have depressed the earnings of all young workers relative to older workers (Grasso, 1977; Welch, forthcoming; Smith & Welch, 1978).[15]

To test the second hypothesis, years of "overeducation" were calculated for each respondent using equation 2. The resulting variable was then regressed on education and other variables according to equation 3. The estimated coefficients appear in Table 2 and estimated years of overeducation by schooling level are illustrated in Figure 1.

The results indicate that overeducation is widespread throughout the labor market, affecting high school as well as college graduates.[16] Furthermore, the evidence suggests that the economic position of college graduates worsened both absolutely and relative to high school graduates between 1970 and 1976. White males with four years of college were more overeducated for their jobs in 1976 than in 1970. The position of black males also deteriorated; they were less overeducated for their jobs in 1970 than high school completers, but by 1976 this relative advantage had disappeared. The position of workers with other educational credentials changed little in this period, except for black males with one-three years of college who improved their position somewhat.

These results are comparable with those reported in other studies. Lucas (1972) estimated years of overeducation by years of schooling completed using 1966 data and observed a relationship similar to one illustrated in Figure 1. Grasso and Myers (1977) also constructed several indices of economic well-being for "new entrants" in two periods: 1966-1968 and 1969-1971. One was based on a prestige rating of respondents' jobs and the other on GED level. In both cases the more recent college graduates experienced a decline in eco-

---

[13] Whether or not the rates of return to schooling fell in this same period is, of course, another matter. Returns to schooling depend upon other benefits from schooling as well as costs. The results presented here do not allow us to determine changes in the returns to schooling between 1969 and 1975. Even if the stability of relative earnings failed to reduce the private returns to schooling, the social return may have fallen nonetheless (Thurow, 1975). Thus, relative earnings, by themselves, only provide a partial understanding of both the economic position of workers in the labor market and the incentives for individuals and society to invest in schooling.

[14] I am continuing to investigate changes in relative earnings since 1975 in order to document any developing trends.

[15] These observed variations also appear to depend on whether one looks at relative *annual* earnings or relative *weekly* earnings. Welch (forthcoming) observed some decline in relative *weekly* earnings between 1969 and 1975 among inexperienced workers using CPS data, but some increase in *annual* earnings during this same period.

[16] It appears that workers in the lowest education groups (less than 8 years of schooling) actually are "undereducated" for their jobs — that is, they hold jobs which require more educational skills than they appear to possess. This finding raises the question of how such workers can perform satisfactorily in their jobs if the specified relationship between GED levels and education is accurate. See the discussion by Scoville (1966).

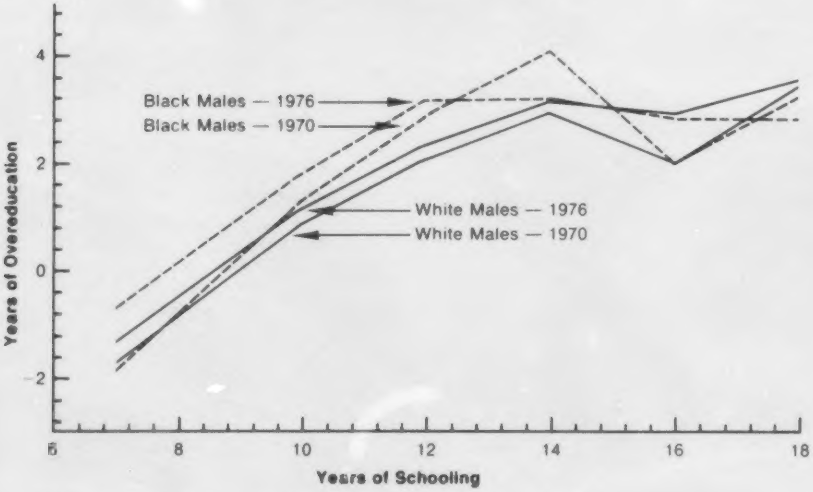
343

## TABLE 2
Estimated Years of Overeducation for Inexperienced Males by Race: 1970 and 1976

| | Whites | | Blacks | |
|---|---|---|---|---|
| | 1970 | 1976 | 1970 | 1976 |
| Schooling | | | | |
| 0-8 Yrs. | −3.78** | −3.67** | −4.74** | −3.86** |
| 9-11 Yrs. | −1.21** | −1.21** | −1.60** | −1.38** |
| 12 Yrs. | — | — | — | — |
| 13-15 Yrs. | .86** | .81** | 1.22** | .03 |
| 16 Yrs. | −.05 | .60** | −.85+ | −.32 |
| 17 + Yrs. | 1.37** | 1.23** | .37 | −.32 |
| Experience Yrs. | −.16** | −.13** | .08 | −.19** |
| Single | — | — | — | — |
| Married | −.20** | −.23** | −.17 | .04 |
| Previously Married | .29 | −.19 | .41 | .17 |
| Private Sector | — | — | — | — |
| Public Sector | −.71** | −.55** | −.38+ | −.17 |
| Self-Employed | 1.31** | −.94** | 1.34 | −2.16* |
| Constant | 2.42 | 2.64 | 3.07 | 3.68 |
| $R^2$ | .17 | .15 | .30 | .13 |
| # of Observations | 7743 | 6355 | 715 | 525 |
| Mean "Overed." in Yrs. | 1.67 | 2.01 | 1.87 | 2.43 |

+ Significant at .10 level
* Significant at .05 level
** Significant at .01 level

## FIGURE 1
Estimated Years of Overeducation by Schooling Level for Inexperienced Males by Race: 1970 and 1976



Note: estimates are computed for a "typical" worker: one with a mean years of experience, single, and employed in the private sector.

nomic position between the two periods. Recall that they also found that recent college graduates did not suffer a decline between these two periods when economic position was measured by relative earnings.

In summary, when economic position is measured by years of overeducation, college graduates appear to have suffered a decline in economic position between 1970 and 1976.

## CONCLUSIONS

The results presented in this paper should be interpreted with caution. In particular, future attention should focus on constructing a more accurate index of overeducation, accounting for changes in the skill requirements of jobs and the educational credentials of workers (Rumberger, 1978). Nonetheless, the results presented here shed some light on the labor market situation for new entrants into the labor force. Based on relative earnings it does not appear that recent college graduates, as a group, are any worse-off than their counterparts six years earlier. Based on years of overeducation, however, it appears that college graduates are worse-off — that is, they were more overeducated for their jobs in 1976 than in 1970.

These two economic indices provide conflicting indications of the position of workers in the contemporary labor market because they focus on different aspects of the relationship between education and work. Differences in earnings between workers with various educational credentials are used to compute social and private incentives to investment in education. Overeducation attempts to account directly for the utilization of educational skills in the labor market (Eckaus, 1964). It may also convey more useful information on the effects of education in the firm. For example, evidence suggests that overeducation may have potentially disruptive and adverse consequences in the workplace (Rumberger, 1978, Chapter 5).

The results reported here contradict the view put forth by Freeman that the relative earnings of college graduates have declined in recent years. On the other hand, they support the view offered by Thurow that the absolute position of college graduates may actually be declining, even in the face of constant relative earnings. In other words, the social rate of return may be declining as more-educated workers displace less-educated ones in the same job, while private rates of return remain constant or even increase.

The preceding discussion suggests that any single, one-dimensional measure of economic well-being provides an unsatisfactory indication of the benefits (either positive or negative) of education in the labor market. It is a conclusion that warrants further discussion.

## REFERENCES

Becker, G. S. *Human capital*. New York: National Bureau of Economic Research, 1964.

Berg, I. *Education and jobs: The great training robbery*. Boston: Beacon Press, 1971.

Blau, P. M. & Duncan, O. D. *The American occupational structure*. New York: John Wiley & Sons, Inc., 1967.

Blaug, M. *An introduction to the economics of education*. Baltimore: Penguin Books, Inc., 1972.

Duncan, G. J. Earnings functions and nonpecuniary benefits. *Journal of Human Resources*, 1976, *11* (Fall), 462-483.

Eckaus, R. S. Economic criteria for education and training. *The Review of Economics and Statistics*, 1964, *46* (May), 181-190.

Eckaus, R. S. *Estimating the returns to education: a disaggregated approach*. New York: McGraw-Hill Book Company, 1973.

Fine, S. A. The use of the dictionary of occupational titles as a source of estimates of educational and training requirements. *Journal of Human Resources*, 1968, *3* (Summer), 363-375.

Freeman, R. B. Overinvestment in college training? *Journal of Human Resources*, 1975, *10* (Summer) 287-311.

Freeman, R. B. *The overeducated American.* New York: Academic Press, 1976.

Grasso, J. T. On the declining labor market value of schooling. Paper prepared for the 1977 Annual Meeting of the American Education Research Association, New York City, April 4-8, 1977.

Grasso, J. T., & Myers, S. C. The labor market effects of investment in human capital. In Kohen, Grasso, Myers & Shields (Eds.), *Career Thresholds* (Vol. 6). Washington D.C.: U.S. Government Printing Office, 1977.

Levin, H. M. Book review: The overeducated American by Richard B. Freeman. *Harvard Educational Review*, 1977, *47* (May), 226-231.

Lucas, R. E. B. *Working conditions, wage rates, and human capital: A hedonic study.* Unpublished doctoral dissertation, Massachusetts Institute of Technology, 1972.

Lucas, R. E. B. Hedonic wage equations and psychic wages in the returns to schooling. *American Economic Review*, 1977, *67* (September), 549-558.

Mincer, J. *Schooling, experience, and earnings.* New York: National Bureau of Economic Research, 1974.

Rawlins, V. L., & Ulman, L. The utilization of college-trained manpower in the United States. In M. S. Gordon (Ed.), *Higher Education in the Labor Market.* New York: McGraw-Hill, 1974.

Rumberger, R. W. *Overeducation in the U.S. labor market.* Unpublished doctoral dissertation, Stanford University, July 1978.

Scoville, J. G. Education and training requirements for occupations. *The Review of Economics and Statistics*, 1966, *48* (November), 387-394.

Smith, J. P., & Welch, F. Local labor markets and cyclic components in demand for college trained manpower. *Annales de L'insee*, 1978, *30-31* (Avril-Septembre), 599-630.

Thurow, L. C. Measuring the economic benefits of education. In M. S. Gordon (Ed.), *Higher Education and the Labor Market.* New York: McGraw-Hill, 1974.

U.S. Bureau of the Census. Money income in 1975 of families and persons in the United States. *Current Population Reports.* Series P-60, No. 105, Washington D.C.: U.S. Government Printing Office, 1977.

U.S. Bureau of the Census. *Public use samples of basic records from the 1970 census: description and technical documentation.* Washington, D.C.: U.S. Government Printing Office, 1972.

U.S. Bureau of the Census and U.S. Department of Labor. Concepts and methods used in labor force statistics derived from the current population survey. *Current Population Reports*, Series P-23, No. 62. Washington, D.C.: U.S. Government Printing Office, 1976.

U.S. Department of Labor, Employment and Training Administration. *Employment and training report of the President.* Washington, D.C.: U.S. Government Printing Office, 1977.

U.S. Department of Labor, Manpower Administration. *Handbook for analyzing jobs.* Washington, D.C.: U.S. Government Printing Office, 1972.

U.S. Department of Labor, Manpower Administration. *Relating general educational development to career planning.* Washington, D.C.: U.S. Government Printing Office, 1971.

U.S. Employment Service. *Dictionary of occupational titles.* (2 vols.) (3rd ed.). Washington, D.C.: U.S. Government Printing Office, 1965.

Welch, F. Effects of cohort size on earnings: The baby boom babies' financial bust. *Journal of Political Economy.* (Forthcoming)

# The Career Information System: A Decade of Developmental Research

BRUCE McKINLAY AND
MICHAEL R. McKEEVER
University of Oregon

Like most innovations, computerized occupational and educational information delivery systems have passed through stages of initial design, development, implementation, replication, and recently proliferation. In 1970, prototype systems could be found in field test situations with limited audiences. Today several are fully operational, serving students and counseling clients in school districts, social agencies, and colleges and universities in all regions of the country. The design, development, and testing of the Career Information System (CIS) and its operational implementation within state-based research and development centers is of interest because of its research program and because it has been the model most replicated by states across the country.

Research within such a developmental environment has great advantages, but it is also conducted under certain constraints. The advantages are that experimentation is a prominent feature of the developmental environment and that the research has immediate impact. In such situations, qualitative and descriptive observations can often be useful as statistical outcome data in answering questions about program design. Thus, formative evaluation techniques which explain as well as judge product performance (Gardner, 1978) have proven useful. Use of a variety of research techniques helps address the often disparate needs of the evaluator, the developer, the user, and various implementers. This is especially true for a consumer oriented information system. System research must take place in natural environments where people use the system at will. Developing a research program in which observations are sufficiently controlled to yield valid results while not so obtrusive as to substantially influence the results is a delicate task.

The state of the art in occupational and educational information delivery systems has been greatly refined over the last *ten* years. Knowledge about the informational needs of guidance counselors, students, and adults and the ability to computerize delivery systems to meet those needs has increased substantially. This paper will present the highlights of the research and development effort conducted during development and implementation of CIS. The system serves about one-tenth of the people in Oregon and has been replicated in nine states.

Operationally, CIS is comprised of an information analysis component, computer and manual information delivery, and counselor training programs. The delivery system consists of QUEST (a structured access device), four primary information files, and four secondary information files.

## STRUCTURED ACCESSING DEVICE

QUEST is a 21-item questionnaire about work preferences to help people initiate their information search. People express a preference on topics such as the nature of the work, level

---

BRUCE McKINLAY and MICHAEL R. McKEEVER are with the University of Oregon, Eugene, Oregon.

of abilities, degree of physical activity, amount of education or training, and wage and salary level. The system identified occupational fields where these interests and abilities are commonly used. It enables the person to estimate the effect of various choices by generating alternative occupational lists for which the person may wish to seek information.

## PRIMARY FILES

*The Occupational Description File* provides up to two pages of up-to-date and localized information on the function, duties, hiring requirements, major employers, work setting, current employment, wage, and employment outlook for all of the major occupational fields found in the state and region.

*The Preparation File* forms a link between the occupations and educational files by providing information on specific skill requirements and alternative ways to prepare for any of the occupations. This file also contains information on high school subjects related to occupations in each of the career families or occupational clusters and a list of related occupations.

*The Program of Study and Training File* describes educational programs (including apprenticeship training) in 130 categories by their content, length, and typical coursework. The file also prints regional lists of the institutions offering a particular program, the titles and descriptions of their programs, the type of diploma they offer, and application procedures.

*The School File* provides institutional information about all public and private colleges, universities, and training schools in the state. Over 60 topics covering the characteristics, curriculum, costs, and services of schools are covered. Secondary resource files include Bibliography and Book File, Visit File, Clubs File, and Financial Aid File.

A career information system affects several audiences, each of which rightfully has its own notions of the most compelling criterion for judging such a system. A psychologist will want to know how such a service enhances individual choice in a career development process; a labor economist will be interested in the accuracy of the system's data; the administrator will ask about its cost effectiveness; and the client may judge the system on its ease of use and personal relevance of the information.

The research and evaluation effort that accompanied and influenced the development of the CIS delivery system is herein described. A fully operational CIS did not result from a single project, but rather a 10-year development program in which a research and evaluation program was an integral part. This research and evaluation effort has concentrated on seven issues.

## MAJOR ISSUES FOR DELIVERY SYSTEM RESEARCH

**1. How does an occupational and educational information delivery system interface with the traditional guidance function?**

The counselor, whether in an educational institution, vocational rehabilitation center, employment office or prison has traditionally been the primary formal information source for people in the various stages of career decision making. Before designing a mechanized system of career information, it was necessary to formulate working hypotheses on:

- role of occupational and educational information in the overall guidance process
- nature of unmet information needs
- role of the guidance counselor when assisted by an occupational and educational information delivery system

**2. How effective is the mechanized delivery of occupational and educational information compared with the delivery of such information through guidance counselors?**

Once a role for an information system in the guidance process has been established, the comparative effectiveness of the innovative versus the traditional delivery means was examined. Primary areas of comparison included:

- storage, retrieval, and update capabilities
- amount of time required
- cost to the institution

**3. Can a computerized information delivery system be client operated?**

The utility of a mechanized information system is significantly restricted if most people require assistance from a professional to operate the system. Two inviolable standards in this respect are:

- operation of the system must be simple including system instructions, computer commands, and methods to correct improper entries
- information must be readable and understandable

**4. Is the structure, order, and format of the access procedure (in this case QUEST) and information files internally logical and flexible so as to optimize successful individual information searches?**

At issue is whether a person can quickly answer specific information questions as well as learn of and retrieve additional information discovered to be useful during system use. Two links, those from QUEST to the file and those between the occupational and educational information files, are particularly important. Among the key indicators of an effective file structure are:

- traffic from the structured access device (QUEST and QUEST List) into the occupational description files
- pattern of multiple file accessing according to the cross reference system used within each file
- minority of users access a file or files in direct fashion which may seem random

**5. Does an occupational and educational information system make an impact on those who use it?**

Impact on people's knowledge, attitudes, and behavior can occur in a number of ways. Some of the major issues include:

- result of increased occupational knowledge of occupations and education
- awareness affect of viable options
- user career plans affect
- actual or educational history affect

**6. Is an occupational and educational information delivery system useful to a wide variety of people?**

Career planning is an important complement to both vocational and liberal education, as well as in job search and career change. Nearly everyone makes career decisions throughout their lives, though the decision styles and options differ. The most effective information service would meet the needs of people during several phases of the career planning and decision-making process as well as those with varying abilities. Among the special groups where use of a mechanized information service should be examined are:

- the disadvantaged
- those undergoing career changes
- labor force re-entrants
- first-time career decision-makers
- career explorers

**7. Is a system of career information attractive to people?**

No system will do any good if it is not used. Key tests of general system appeal include:

- client reported affective responses to the system
- client repeat usage rate

— frequency of use within an institution
— number of institutions using the system

## RESEARCH TECHNIQUES

CIS has used a variety of evaluation techniques to determine system effectiveness in each of these seven areas. A description of the research techniques and their applicability to select research topic areas follows:

### Literature Reviews

Review of available literature was important during the early design phases of the Career Information System. In particular, career development literature helped define the role of information in the career choice process. Lack of empirical data on this subject is probably the single biggest gap in occupational choice research, so the words of top career development theorists were used to help elucidate, often inferentially, the potential role of career information in the guidance process. Literature reviews were also helpful in establishing the validity of client self-reports of abilities and preferences on the QUEST instrument.

### Review of Current Counselor Training Programs

In the early 1970's little had been written about how guidance counselor training programs equipped students to gather, interpret, and disseminate occupational and educational information. CIS undertook a study of Northwest pre-service training programs and local in-service programs for guidance counselors. College catalogues and course lists were surveyed for every college and university in Oregon and Washington and department heads at several schools were interviewed to pinpoint the nature, scope, and status (required or voluntary) of all courses dealing with career information. In addition, guidance counselors at local agencies were interviewed to identify the nature and frequency of in-service programs dealing with this subject. These data were essential in determining the labor market information needs of guidance counselors.

### Expert Consultant Panels

Product development in a new, interdisciplinary field would be difficult indeed without the insight and advice of experts and practitioners. CIS fused parts of two previously distinct disciplines of labor market analysis and career development psychology, hence professionals from both fields were used heavily, in particular to make recommendations on the construction of QUEST. This technique is generally accepted today in higher education research (Legge, 1978).

### Computer System Use Records

This data gathering technique is possibly unique to computerized delivery systems. Using a special statistical package program, the computer can record, reformat, and list cumulative data on system use by clients. Data on frequency of system use, average use time, and frequency of individual file use are continuously compiled for each CIS site (the program does not keep individual client records). This data source provides CIS researchers and administrators with a good overall measure of system use. Usage rates at different site types are compared and used to identify successful site implementation strategies as well as sites in need of assistance. Similarly, data on response distributions provide a good basic monitor for that instrument. Usage rates for important computer commands and most frequently accessed entries within each file are also tabulated.

### Computer Printouts

Data on topics too specific to warrant continuing compilation and storage by the computer can be obtained periodically by examining individual computer printouts. CIS staff have used this technique to count frequency of computer command errors and to determine the order in which files are accessed. These data were essential to determine whether the file structure was encouraging logical cross-referencing activity between files as intended.

### Interviews

Interviews have been used to gather statistically interpretable data as well as insightful anecdotal comments. Telephone interviews with control and experimental groups (counselor delivered information versus CIS delivered information) were conducted at a community college to determine comparative motivation, behavior, satisfaction, impact, and time spent collecting information of both groups of students. After initial system pilot tests in six Eugene area social agencies and schools, guidance counselors were interviewed to determine specifically how they utilized CIS in the counseling process and how satisfied they were with its performance. Several counselors at three Portland area Employment Service offices were interviewed after pilot use there.

An excellent check for Quest item clarity has proven to be interviews with different groups of students. Academically successful and disadvantaged groups bring different perspectives and interpretations to word meaning; inclusion of both groups in the QUEST editing process has produced good results. Interviews with parents of student CIS users have also been conducted to determine how frequently CIS use is discussed in the home.

### Pencil-Paper Instruments

Pencil-paper questionnaires and tests have provided the broadest range of evaluation data on CIS use and effectiveness. Specific design oriented examples are listed below:

*Control-Experimental-Experimental Group Post-Test.* A major study at three large city Employment Service offices measured the comparative satisfactoriness, ease of use, readability, and impact of CIS on nondisadvantaged versus disadvantaged clients and manual needle-sort versus computer terminal users.

*Control-Experimental Group Post-Test.* At the end of a school year of CIS use at a high school, users and non-users were administered questionnaires to determine what motivated some to use CIS and why others stayed away. Those using CIS also rated the system on ease of use, completeness and relevance of information, general satisfaction, and impact.

*Experimental Group Pre-Post Test.* This experimental design is necessary to measure short-term impact of CIS use. When the educational files were added to CIS, pre- and post-use instruments were used to measure changes in reported choices of occupations, programs of study and training, schools, and the certainty of users choices. Impact data were collected in schools, correctional institutions, and shopping centers. Shopping centers were chosen in order to reach an adult population including women reentering the labor force or considering additional education, persons unhappy in their present jobs, and unemployed persons. Results were controlled for age, sex, educational standing, and family income.

*Experimental Group Post-Test.* Post use questionnaires have been administered to junior high, high school, community college and four-year university students, social agency counselees including Vocational Rehabilitation and Employment Service clients, adults at shopping centers, inmates at correctional institutions, and disadvantaged on topics related to the process of CIS. A recent application of this technique is an on-line evaluation question which the user answers after he or she has completed the CIS computer program.

## Major Findings

The major findings with regard to CIS design and operation are presented here. The findings evolve from a research and evaluation program that employed a variety of sources and methods in documenting, shaping, and appraising the developmental process.

**1. How does an occupational and educational information delivery system interface with the traditional guidance functions?**

Many writers have attempted to explain career development. Despite sociological and accidental influences, the common conclusions of the foremost authorities is that career development is essentially a series of individual choices which occur over time (Ginzberg, 1972; Super, 1957; Tyler, 1969). The key factors affecting the decision-making process include: (1) the individual's decision-making skills, (2) knowledge of self, and (3) knowledge of the world of work. Tyler says that to make sound career choices the individual needs "relevant information about the field of work" (Tyler, 1969, p. 110). Super considers "possession of information concerning the preferred occupations" a very essential part of an individual's vocational development (Osipow, 1968, pp. 124-25). Nobody claims that these decisions are based solely on labor market data, but there is consensus that occupational information is one of the ingredients in career decisions. This literature yielded a conceptual framework within which an information system might function, but it was less articulate about the form and content that information should take to be most useful in guidance. These matters had to be inferred from the literature and from a review of traditions in the career information field.

Guidance counselors were found to be better prepared to deal with other ingredients in career decisions than the information component. A survey of four-year institutions in Washington and Oregon found that while nearly all offered at least one course relating to vocational information, those courses did not prepare counselors to judge the access procedures, the delivery media, or the format of the occupational information (Selton, 1970). What pre-service training programs lacked, in-service programs did not remedy. In a survey of in-service training programs in several agencies, the researcher reported that "it seems safe to conclude that counselors do not receive any formal in-service training in the use of labor market information" (Shadbolt, 1970, p. 1).

Not surprisingly, a review of the labor market information publications found in local schools and agencies showed that counselors there made little use of existing occupational information sources. CIS was found to be a valuable resource in the counseling program. Pilot tests found that counselors could let clients retrieve information from the computer terminal alone, allowing the counselor to concentrate on interpretations and personal planning (Weick, 1972). In a pilot test at a comprehensive high school, most students were able to operate CIS independently, going to their guidance counselor to discuss their experience afterward (McKinlay & Adams, 1971).

**2. How effective is the mechanized delivery of occupational and educational information compared with the delivery of such information through guidance counselors?**

As a component of a guidance program, CIS was proven to have many advantages including supplementing the counselor. Counselors are trained to help people interpret their feelings, not to compile information about a complex and dynamic labor market. It almost goes without saying that the combination of three or four professional information analysts combined with the superior storage, retrieval and updating capabilities of the computer would far surpass the ability of any single staff person untrained in labor market data analysis and principally committed to direct service to clients. One field test showed a substantial time savings to the counselor. With access to CIS, average information search time dropped from 1.69 hours to .85 hours per person (Ross, 1971).

**3. Can a computerized information delivery system be client operated?**

Not much occupational data has been applied to guidance before, and putting computers into the hands of average people was a new application of the medium that raised many practical questions. Thus, numerous user surveys have been conducted, and the Career Information System has consistently been found easy to understand. In an early test 95 and 94 percent of the users rated the occupational descriptions and QUEST easy to understand (McKinlay & Adams, 1971). Readability formulas rated the original QUEST between seventh and tenth grade levels and the occupational descriptions somewhat more difficult, although readability formulas have limited validity as a measure of the consumability of specific data such as occupational information (Readability and Validity). Tests with disadvantaged clients found that 94 percent rated QUEST easy to read (Weick, 1972) and 93 percent gave the occupational descriptions a similar rating (Weick, 1972). Reading is required, of course, and the system is not directly usable by persons so severely disadvantaged that they lack basic language skills.

CIS has also been proven mechanically simple to operate. After expanding the file structure to include educational and training information, 100 percent of the users in one field test rated the Description, Preparation, and Program files easy to use while over 90 percent gave the tabular School file a similar rating (McKeever, 1975). Examination of user printouts for operational errors found that over half (50.2 percent) made no errors at all while using the system and nearly 9 out of 10 made three errors or fewer (McKeever, 1975). The system is designed so that errors are easy to correct and do not disrupt the program. Corrections apparently are not particularly bothersome to users as their perceptions of both system adequacy and relevance were not correlated with the number of operating errors made (McKeever, 1975). Computer system use records and user evaluations have been instrumental in stimulating refinements in computer routines.

**4. Does the structure, order, and format of the access procedure and information files optimize individual information searches?**

QUEST, designed to help people begin their information search, met this primary goal quite effectively. In a recent examination of usage patterns for a revised QUEST, over 80 percent of CIS users at junior high schools, high schools, community colleges, and correctional institutions used the occupational titles from their QUEST list to access an Occupational Description. Earlier research had already shown that users move directly and logically from QUEST to either the Program or Preparation files (McKeever, 1975).

The other important conceptual link for users to make is between the occupation and educational information. Such a system must reflect the diverse and flexible relationships that exist between education and work; it must not simply make mechanical conversions that oversimplify reality. Examination of users printouts and computer use records shows that over 10 out of 20 users who accessed the Description and Preparation files made links between them. Nearly four out of every five users accessing both the Occupational Preparation and the Training Program files made the conceptual link between education and work described in the two files (McKeever, 1975).

**5. Does an occupational and educational information system make an impact on those who use it?**

The first and most basic test of an information system is whether people's knowledge increases from using it. An objective test for local occupational knowledge among high school students was used to determine whether CIS users knew more about the occupations they were considering. The CIS user group scored 32 percent better than the control group, a chi square significance at the .001 level. For national occupational knowledge, the mean for users was again better than for non-users (significance at .05) (McKinlay & Adams, 1971). Complementary evidence was found at the junior high school level with system users scoring higher on an objective test, reporting higher vocational aspirations, and listing nearly twice as many occupational titles as non-users (Adams & Fowler, 1971).

Impact on user can also be judged in terms of people's career plans. In addition to increasing actual knowledge, useful information should affect people's schooling or work plans. In a pre- and post-test analysis from a sample of adults, high school students, community college students, and inmates, nearly three out of ten (29.2 percent) actually changed their first choice occupation after using the system, over a third (35.8 percent) changed their first choice program of study and training, and 10.5 percent changed their first choice school (McKeever, 1975).

A final measure of system impact on users' career plans is whether it helps people identify new career options. One test showed nearly half of CIS users reporting that they had received several job ideas (49.7 percent) (McKeever, 1975), while a recent study of a revised QUEST found over eight out of ten users reporting their QUEST list had included new occupations they would seriously consider for future work. In a test with disadvantaged clients, 76 percent reported that their QUEST list had given them new job titles to consider for future work (Weick, 1972), a particularly important effect for a group whose options and knowledge are so circumscribed.

A field test at a high school produced an unanticipated result — students were discussing their experience using CIS with their parents. In a telephone survey of a small sample of users' parents, 64 percent reported having discussed their children's use of CIS. Of these parents, a little more than 80 percent had seen their children's QUEST list, occupational description, printout, or questionnaire. Discussions between parents and students lasted an average of 47 minutes and frequently occurred more than once (Wish, 1975). This piece of data is intriguing because significant others, particularly parents, are influences in the occupational choices of young people.

**6. Is the delivery system useful to a wide variety of people?**

Career development theory implies that labor market information is helpful at all stages. This is not prima facie cause to conclude that all information delivery systems will be equally beneficial to all groups, however. To determine the range of CIS effectiveness, system researchers have evaluated it with adults, the disadvantaged, inmates, rural, sub-urban and inner city junior high, senior high school, and community college students. Evaluation results have also been studied on the basis of age, sex, family income, and educational background. This section will summarize research findings on three groups: adults, disadvantaged, and inmates.

Inmates found the system easy to operate (only six percent made more than three errors). A majority (65.6 percent) rated QUEST questionnaire relevant to their career planning process and over seven out of 10 (71.7 percent) received new job ideas for serious consideration from

QUEST (McKinlay, 1975). Over 70 percent of the sample rated each of the four major information files relevant to their decision-making process, and CIS information caused several inmates to change their first choice career field (19 percent) and educational program (26 percent). Larger percentages changed the certainty of their first choice career field (22 percent), educational program (36 percent), and school (13 percent). General satisfaction with CIS among inmates was high with 90 percent reporting they would probably or definitely use the system again, nearly all (98 percent) saying they would probably or definitely recommend the system to a friend, and all subjects claiming the CIS information would be helpful in planning their release program (McKinlay, 1975).

A test of disadvantaged and non-disadvantaged clients in three Employment Service offices, including special offices for ghetto residents and disadvantaged youths, found that disadvantaged clients rated the occupational descriptions accurate and up-to-date (80 percent), complete (81 percent), easy to read (93 percent), fun to use (86 percent), and relevant to their own likes, dislikes, values, and skills (96 percent) (Weick, 1972).

**7. Is the system attractive?**

Both user surveys and system use records show that people like to use CIS and feel they benefit from doing so. In an early CIS field test in which the system received completely voluntary use, 550 out of a population of 1,040 high school students used the system in a five-month period. Most used CIS more than once and the average student used the system 2.3 times (McKinlay & Adams, 1971). Of those who used the system, most did so because they were "personally interested in looking for occupational information" (41 percent) or were "curious about the computer" (32 percent) (McKinlay & Adams, 1971). Nearly all (99 percent) said CIS was "fun to use," 84 percent were satisfied with the information they received, 87 percent had found the information they were looking for, 86 percent said they wanted to use CIS again, and 77 percent had already recommended the system to a friend (McKinlay & Adams, 1971). In an earlier study at the same school, nearly nine out of ten (88 percent) users recommended that CIS be kept at their school (McKinlay & Ross, 1970).

## CONCLUSIONS AND OBSERVATIONS

A developmental program is a fertile environment in which to do research because there are numerous design and impact questions to be answered. The research need is especially diverse in a novel, interdisciplinary undertaking like the development of the Career Information System, which combines labor market research with computer technology in guidance programs. Consequently, the CIS research program has used a variety of data sources and formative research methods to describe, influence and assess the developmental program. The diversity of the research and the ongoing nature of the research effort have necessarily limited this paper's description of any single survey or analysis.

Persons familiar with systems for career information will notice other limitations of this paper. First of all, it describes only the evaluation of the delivery components of the system, omitting the other major operational components of information analysis and counselor training. Likewise, it has described only the research on the Career Information System which was part of the original developmental program, thus omitting two other bodies of research. Developmental research on other systems for the delivery of career information has not been discussed.

Implementation of the Career Information System in other locations is generating a body of project reports, evaluation studies, and research by implementers and scholars throughout the country. This research has also been omitted because of this paper's emphasis on the initial developmental research. A considerable degree of comparability with the developmental research has been maintained in these implementation studies. They verify many of the general observations described here, but they include some distinctive local difficulties as well.

As systems for career information become more widely used, there will be a need for broader based and better endowed research. Methodological experimentation can produce better tools for evaluation. Those currently available are often inappropriate and those originated for the purpose are frequently non-standardized. Techniques leading to intermediate range follow-up studies are needed to ascertain the lasting effects of the availability of easily accessible information through these systems.

Similarly, rigorous comparisons of the several systems would contribute to an understanding of what is better, not just different between one system and another. While findings about the attractiveness of systems is common in the evaluations that have been done, the systems are not all interchangeable. Different designs do have different effects on different audiences and on operating costs as well.

A third research need is for more studies of system use with special labor force groups and nontraditional students. Though the research described here has indicated that CIS serves surprisingly diverse audiences, it also reveals that their uses differ. Those differences need to be understood and protected as system use is integrated into institutional services.

## REFERENCES

Adams, D. & Fowler, L. K. *Vocational counseling at the junior high level: A case study at Shasta Junior High School, Eugene*. Eugene: University of Oregon, 1971.

Cairo, P. C. *Annotated bibliography on computer-assisted counseling and guidance*. New York: Teachers College, Columbia University, 1977.

Gardner, D. E. Give evaluation frameworks implications for decision making in higher education. *Journal of Higher Education*, 1978, *48*(5), 571-593.

Ginzberg, E. Toward a theory of occupational choice: A restatement. *Vocational Guidance Quarterly*, March 1972, pp. 169-175.

Legge, L. H. Program evaluation in higher education. *Journal of Higher Education*, 1978, *49*(5).

McKeever, M. Field test evaluation. *Educational components for a career information system* (project report). Eugene: University of Oregon, 1975.

McKinlay, B. & Adams, D. *Evaluation of the occupational information access system as used at Churchill High School* (project report). Eugene: University of Oregon, 1971.

McKinlay, B. & Ross, L. *Evaluation of occupational information access system use in six pilot agencies*. Eugene: University of Oregon, 1970.

Osipow, S. H. *Theories of career development*. New York: Appleton-Century-Crofts, Inc., 1968.

Ross, L. *The effectiveness of two systems for delivering occupational information: A comparative analysis*. Eugene: University of Oregon, 1971.

Selton, R. *Survey of counselor education in Oregon and Washington*. Eugene: University of Oregon, 1970.

Shadbolt, M. J. *Survey of in-service training in labor market information*. Eugene: University of Oregon, 1970.

Super, D. E. *The psychology of careers: An introduction to career development*. New York: Harper & Row, 1957.

Tyler, L. E. *The work of the counselor*. New York: Appleton-Century-Crofts, Inc., 1969.

U.S. Department of Labor, Employment and Training Administration. *Career thresholds, Vol. 6, a longitudinal study of the educational and labor market experience of young men*. Washington, D.C.: U.S. Government Printing Office, 1977.

Weick, J. *Occupational information for ES counseling. An evaluation of occupational information access pilot usage in three Portland employment division offices*. Eugene: University of Oregon, 1972.

Wish, J. R. *New markets for career information. Education components for a career information system* (project report). Eugene: University of Oregon, 1975.

## Synthesis

Employment and Training research offers tremendous potential for well-trained, competent vocational education researchers. There are several factors which support this conclusion. First, the U.S. Department of Labor is interested in many of the same areas of research as vocational educators. As the result of these compatible priorities, research funds are continually made available to vocational education to sponsor well designed proposals that will build upon the information base currently available to the Department of Labor. Secondly, many of the current DOL sponsored developmental occupational training programs are innovative. Such innovative programs can provide an opportunity for vocational education researchers to study problems in a context applicable to traditional programs of vocational education. Thirdly, the developmental and socially related goals of E&T sponsored research will energize more cooperative research activities relating to special needs populations. Such activities will provide for the improvement, both qualitatively and quantitatively, of services offered by vocational education. Finally, the desire of the U.S. Department of Labor to focus some of its resources on sophisticated research projects of national scope will provide unique opportunities to many vocational education researchers. There are comparatively few research opportunities to study populations and samples of literally thousands of individuals. Likewise, there are relatively few projects that are concerned with the study of both the training and the development (social, cultural, economic, and educational) of subjects. These unique foci offer the vocational education researcher an opportunity to greatly expand his or her technical abilities and interests.

Upon reviewing the current and recent E&T related research, it became apparent that a high percentage of the studies could be classified by the following functional groups:

1. Follow-Up Studies,
2. Evaluation Studies,
3. Policy Studies,
4. Experimental Studies,
5. Longitudinal Studies,
6. Cluster Studies (multiple projects with a common goal(s))
7. Reflective Synthesis (historical)

The five articles in this section each represent one or a combination of the above noted types of studies. Four of the representative studies are national in scope. The fifth, by Dr. Max Wortman, et al., is an ongoing project funded by the Governor's Employment and Training Council of Virginia. This project was chosen to illustrate the types of E&T related studies that are often needed by state CETA agencies. The project reports resulted from sponsored activities from one or more of the following types of E&T funding sources:

1. Governor's Employment and Training Council (CETA-State)
2. Prime Sponsor (CETA-State)

357

3. U.S. Department of Labor (Office of Research, Employment and Training Administration)
4. Balance-of-State (CETA-State)
5. U.S. Department of Labor (CETA-Regional Office)
6. Contractors and sub-contractors of CETA sponsored programs (CETA-State/National)

The projects mirror universal research philosophy of E&T agencies. Sponsored E&T research and development usually possesses three characteristics. First, the studies usually have immediate application to the programs conducted by ETA. Second, the research designs generally address the problem in a realistic and efficient manner. Finally, E&T research and development is primarily focused upon problems and concerns that are identified by local program operators. Thus, functional research is the key to successful E&T research efforts. To illustrate these points the following brief reviews of the representative studies are presented.

## PARNES AND SPROAT STUDY

The National Longitudinal Surveys represent a series of projects that were combined and funded to provide a data base for the design of public employment and training policy. The project was initiated in 1965 at the Center of Human Resource Research, The Ohio State University, under contract to the U.S. Department of Labor. The project enables NLS researchers to collect and analyze data over time for men (age 45-49), women (age 30-44), young men (age 14-24), young women (age 14-24), and youth (age 14-21). Data reflect the successes and failures of growing up, getting an education, obtaining employment, unemployment, etc. Five nationally representative samples were chosen to represent those population segments that are considered to be most likely to experience difficulties in the labor market. The "men and women" respondents are interviewed every other year while the other three samples are interviewed annually. Each year the data are analyzed by an interdisciplinary team from The Center for Human Resource Research. Computer tapes are developed for dissemination to the research community.

The project is unique in that it collects data not otherwise available. It provides a quantification of a variety of labor market factors over a period of time. Such quantification allows for a study of the labor force. Secondly, the project facilitates study of the developmental factors relating to the individuals. Finally, the study offers a rare opportunity to compare the developmental or causal effects of two or more variables.

The NLS represents, in this section of ARRIVE, the longitudinal study commonly funded by E&T sponsors. Actually, it fits several other categories of research. It is, in a sense, a follow-up and cluster study.

## KATZ STUDY

Dr. Katz analyzes the conceptual issues relating to the contributions of the employment service(s) to the continued employment of the ES client. He also explored the feasibility of estimating the influence of ES services on the earnings of the individual ES client. Finally, the study sought to determine if nonexperimental data sources could be used to accomplish the first two objectives. Two data bases were used in the study. The first was the 1972 Bureau of Labor Statistics Job Finders Survey (JFS) and second was the Employment Service Automated Reporting System (ESARS) and Continuous Work-Benefit History (CWBH) files of the Pennsylvania Department of Labor. His findings revealed that ES clients take longer to get a job than do nonapplicants. The study had many other interesting findings and concluded that nonexperimental evaluations were useful even though plagued with many limitations. This study represents an excellent example of evaluation studies that are intended to influence E&T policy development.

## WORTMAN, MURRMAN, AND JONES STUDY

As previously stated, this study by Max Wortman, et al., is currently in progress and is sponsored by the Governor's Employment and Training Council of Virginia. The project is designed to investigate the extent to which educators and CETA prime sponsors have been able and willing to develop cooperative linkages. Emphasis will be placed on the identification of exemplary linkages.

The study will utilize data collected through (1) compilation of documents, reports, and other CETA related publications, (2) questionnaires (mailed), and (3) on-site visitations where interviews will be made relating to state and local levels of E&T involvement. The project staff will utilize both objective and subjective measures to evaluate the linkage factors including (1) participant coverage and involvement; (2) programmatic costs; (3) local demands for skill acquisition; (4) coordination efforts; and (5) program innovation.

The project plans to develop a policy model of CETA-Education linkages in local labor markets. The model should establish direction for the following types of linkages: (1) policy; (2) planning; (3) structural; (4) financial; (5) programmatic; and (6) operational. This study is characteristic of the types of reflective synthesis (historical) and evaluation methodologies commonly used by E&T researchers to formulate a basis for policy model development.

## RUMBERGER STUDY

In his study of college graduates, Dr. Rumberger examined the economic position of college graduates between 1969 and 1975. He measured the relative earnings of the subjects to determine if any deterioration in earnings had occurred. The study sought to measure the utilization of educational skills by the subjects to determine if the occupational position of the subjects worsened during the period from 1969 to 1975. An overall goal of the study was to test the commonly accepted views of Richard Freeman and Lester Thurow with a new base of data. He utilized two major sources of data in his study. The first source was the March, 1976, Current Population Survey (CPS) and the second was the 1970 1/1000 Public Use Sample of the U.S. Bureau of Census 1972. The findings revealed that college graduates were not worse off financially at any time during the period studied. Another finding suggested that the college graduates were being increasingly over-educated for the jobs available to them upon graduation.

This type of study is often funded by E&T agencies. It performs two functions. As a study that uses both follow-up and reflective synthesis methodology, it provides data that relates to the problems of college graduates. The study may also be one of several studies in a cluster. This study is one of hundreds of thematic E&T studies that contribute to an overall understanding of the labor force.

## McKINLAY AND McKEEVER STUDY

The last article in this section presents a review of sponsored research that was specifically targeted to the development of a career information system for use by E&T programs. The studies that supported the development of the CIS were specifically designed from a cluster concept to contribute to the (1) conception and development of the early models, (2) refining the model, (3) testing the CIS, (4) implementing the CIS, and (5) finally, the evaluation and modification of the system. Thus, the project was designed and funded by phases.

The project that supported the development of the CIS utilizes several research designs. Survey, experimental, evaluation, and follow-up studies were conducted. Again, the cluster concept was used to link the individual project objectives to a primary goal, the development and implementation of the Career Information System. The result was an important contribution to the programs operated through the provisions of CETA.

## SUMMARY

Vocational education researchers are uniquely qualified to invest time and energy in the research activities currently sponsored by E&T agencies at both the state and national levels. The goals of E&T research agencies are often common to those of vocational education. The unique opportunities offered by E&T research involvement will serve to complement the research activities of vocational education with the result being the enhancement of vocational education programs. Proposals seeking support by E&T agencies should focus upon problems and possible solutions. Efforts should be made to describe in the proposal the benefits of such research to the DOL constituency. If the above concerns are adequately addressed, a competent vocational education researcher will find willing support and a continuing commitment to a comprehensive program of employment and training research and development.